

**FIG. 1**

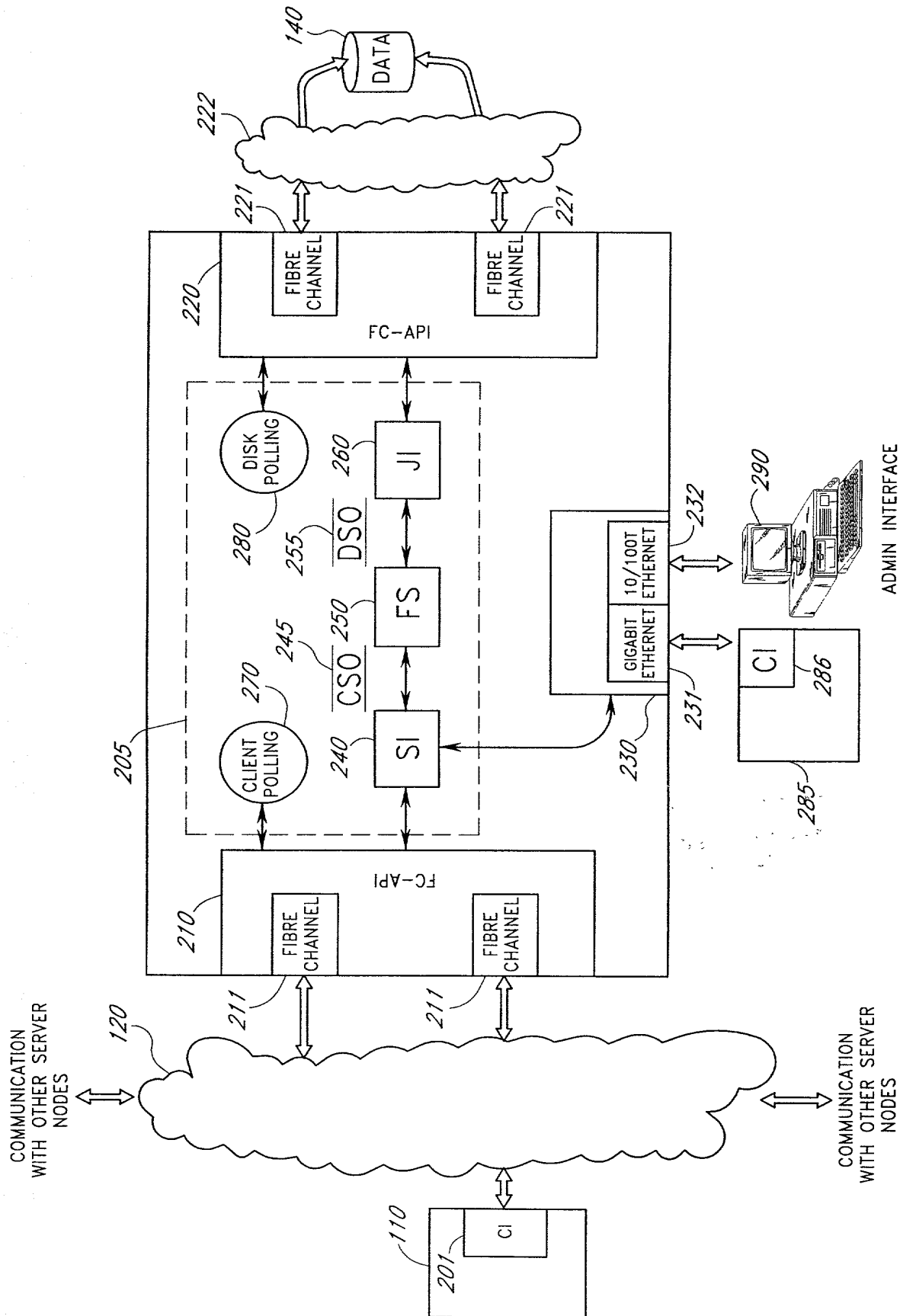


FIG. 2

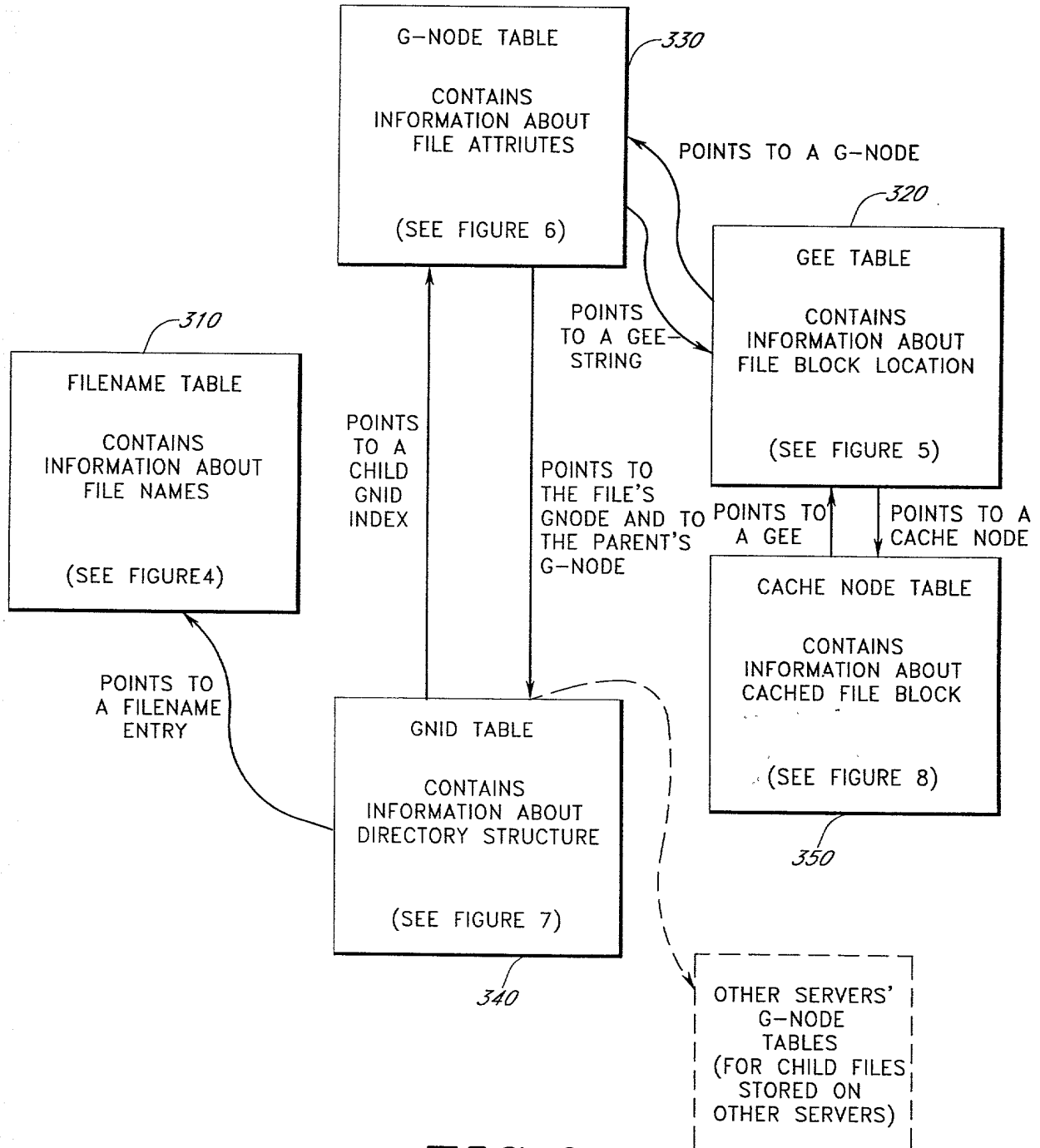


FIG. 3

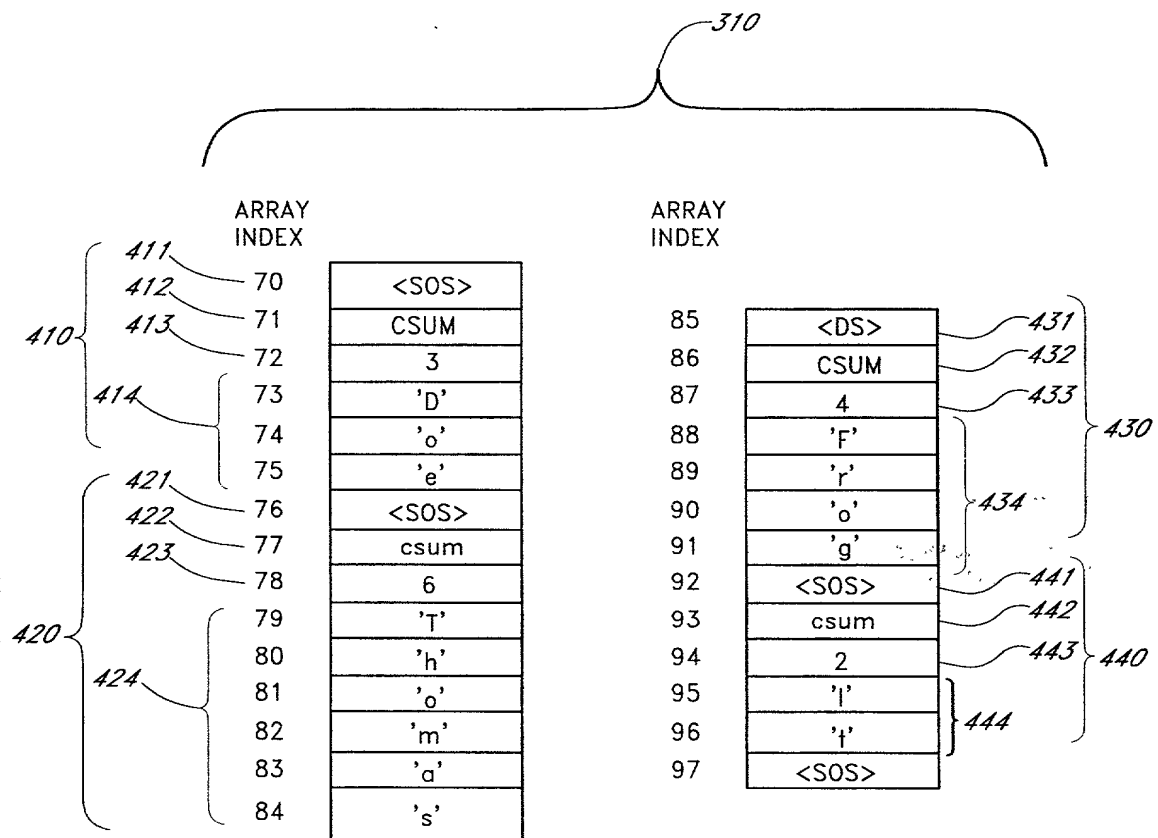


FIG. 4

590			591		592	
INDEX	G-CODE	DATA	FILE	LOGICAL BLOCK		
510	GNODE	GNODE=67, EXTENT=2, ROOT=TRUE				
511	DATA	DISK LOGICAL BLOCKS: 456,457 DRIVE 13	1			
512	DATA	DISK LOGICAL BLOCKS: 667,668 DRIVE 15	2			
513	DATA	DISK LOGICAL BLOCKS: 112,113 DRIVE 19	3			
514	PARITY	DISK LOGICAL BLOCKS: 554,555 DRIVE 2				
515	DATA	DISK LOGICAL BLOCKS: 458,459 DRIVE 13	4			
516	DATA	DISK LOGICAL BLOCKS: 669,670 DRIVE 15	5			
517	DATA	DISK LOGICAL BLOCKS: 119,120 DRIVE 19	6			
518	PARITY	DISK LOGICAL BLOCKS: 556,557 DRIVE 2				
519	LINK	INDEX 76				
...	...	...				
520	GNODE	GNODE=67, EXTENT=3, ROOT=FALSE				
521	DATA	DISK LOGICAL BLOCKS: 460,461,462 DRIVE 13	7			
522	DATA	DISK LOGICAL BLOCKS: 671,672,673 DRIVE 15	8			
523	PARITY	DISK LOGICAL BLOCKS: 121,122,123 DRIVE 19				
524	LINK	INDEX 88				
...	...	...				
525	GNODE	GNODE=67, EXTENT=3, ROOT=FALSE				
526	DATA	DISK LOGICAL BLOCKS: 463,464,465 DRIVE 13	9			
527	DATA	DISK LOGICAL BLOCKS: 674,675,676 DRIVE 15	10			
528	PARITY	DISK LOGICAL BLOCKS: 124,125,126 DRIVE 19				
529	GNODE	GNODE=43, EXTENT=4, ROOT=FALSE				
...	...	...				

FIG.5

ATTRIBUTE DATA	
602	FILE ATTRIBUTE-TYPE
604	FILE ATTRIBUTE-MODE
606	FILE ATTRIBUTE-LINKS
608	FILE ATTRIBUTE-UID
610	FILE ATTRIBUTE-GID
612	FILE ATTRIBUTE-SIZE
614	FILE ATTRIBUTE-USED
620	FILE ATTRIBUTE-FILEID
622	FILE ATTRIBUTE-ATIME
624	FILE ATTRIBUTE-MTIME
626	FILE ATTRIBUTE-CTIME
628	CHILD GNID INDEX
630	GEE INDEX-LAST USED
631	GEE OFFSET-LAST USED
632	GEE INDEX-MIDPOINT
633	GEE OFFSET-MIDPOINT
634	GEE INDEX-TAIL
635	GEE OFFSET-TAIL
636	GEE INDEX-ROOT
638	GNODE STATUS
640	QUICK SHOT STATUS
642	QUICK SHOT LINK

**FIG. 6**

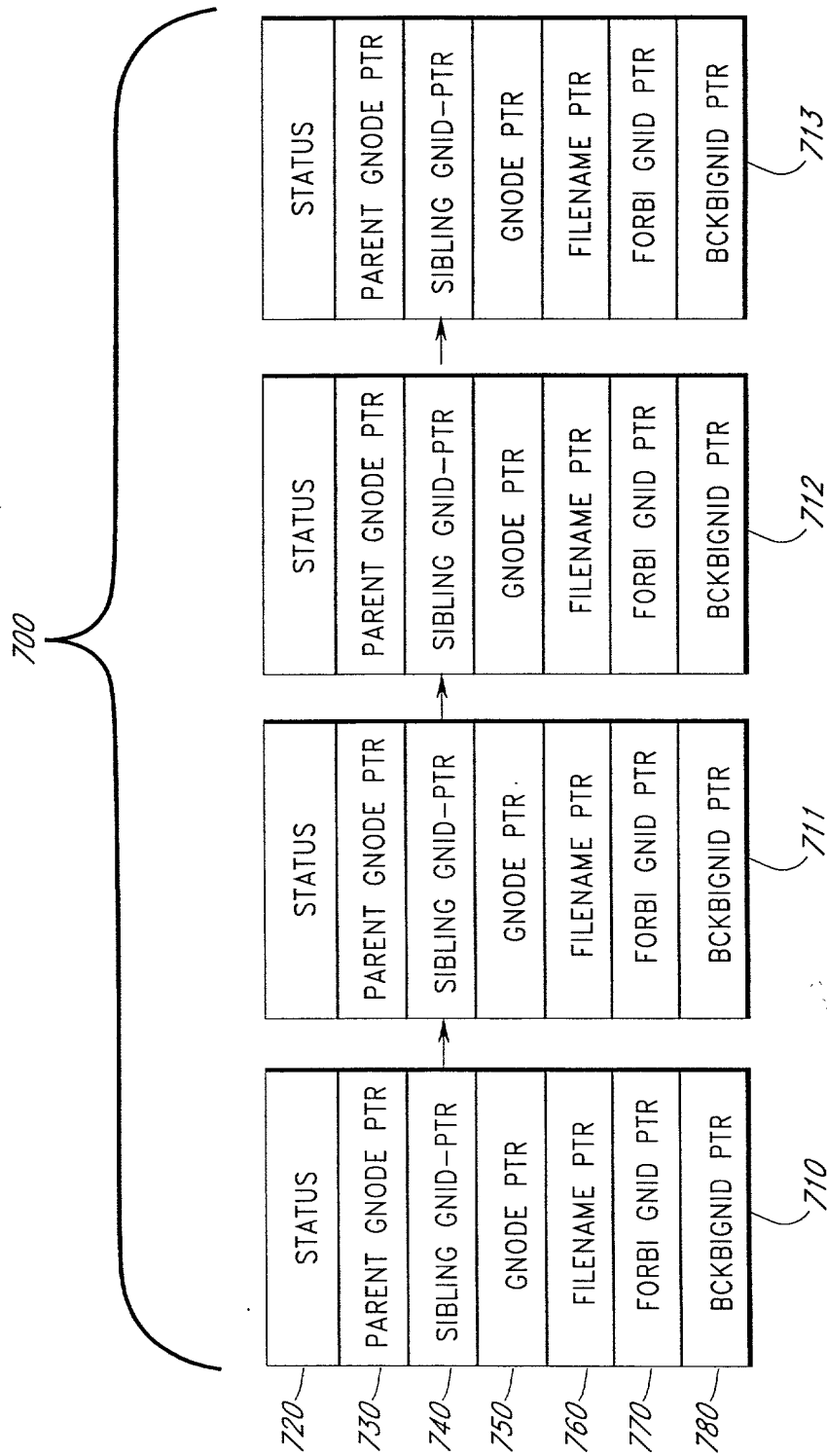
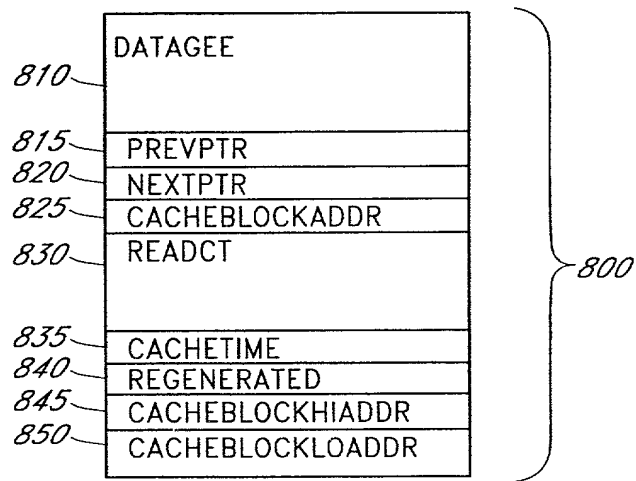


FIG. 7

**FIG. 8A**



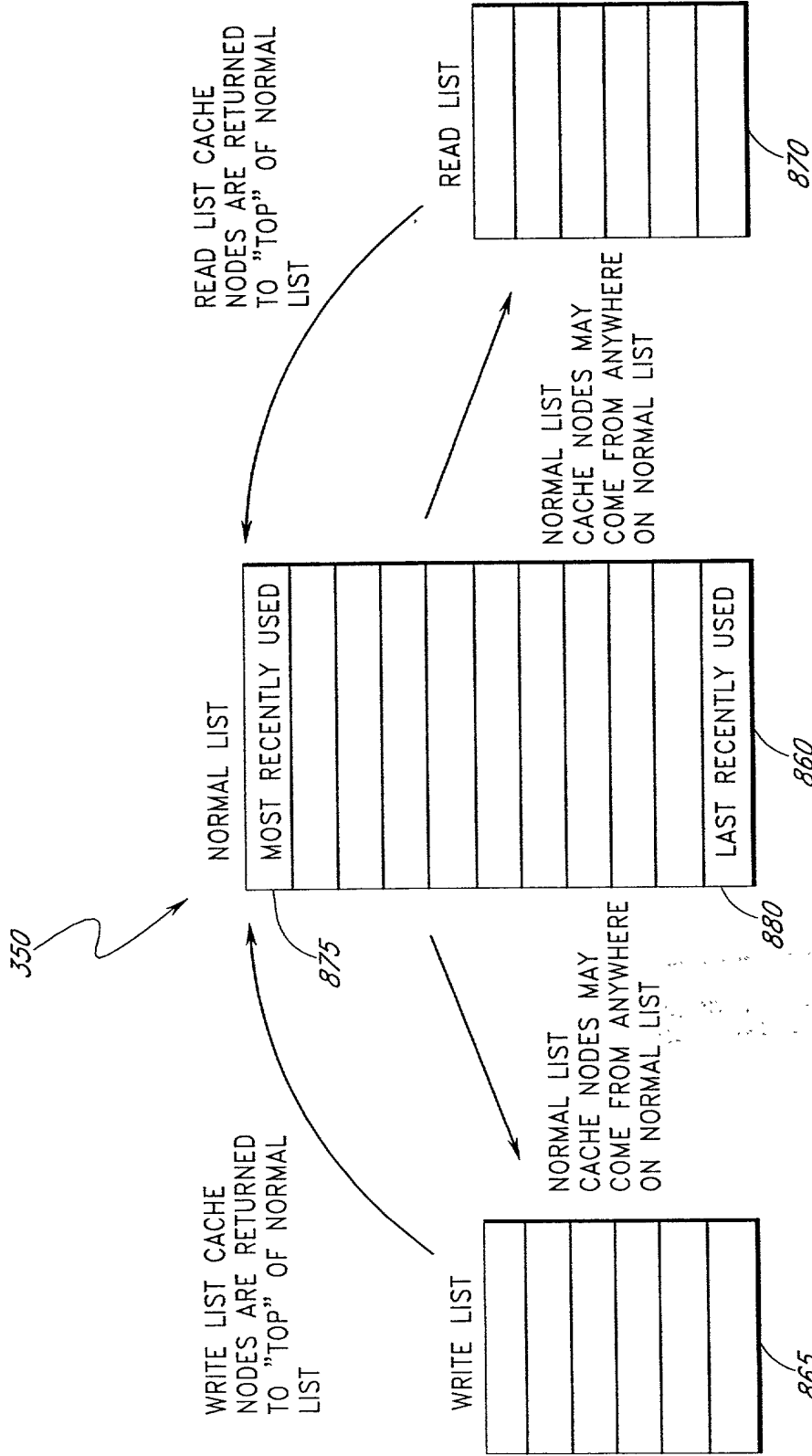


FIG. 8B

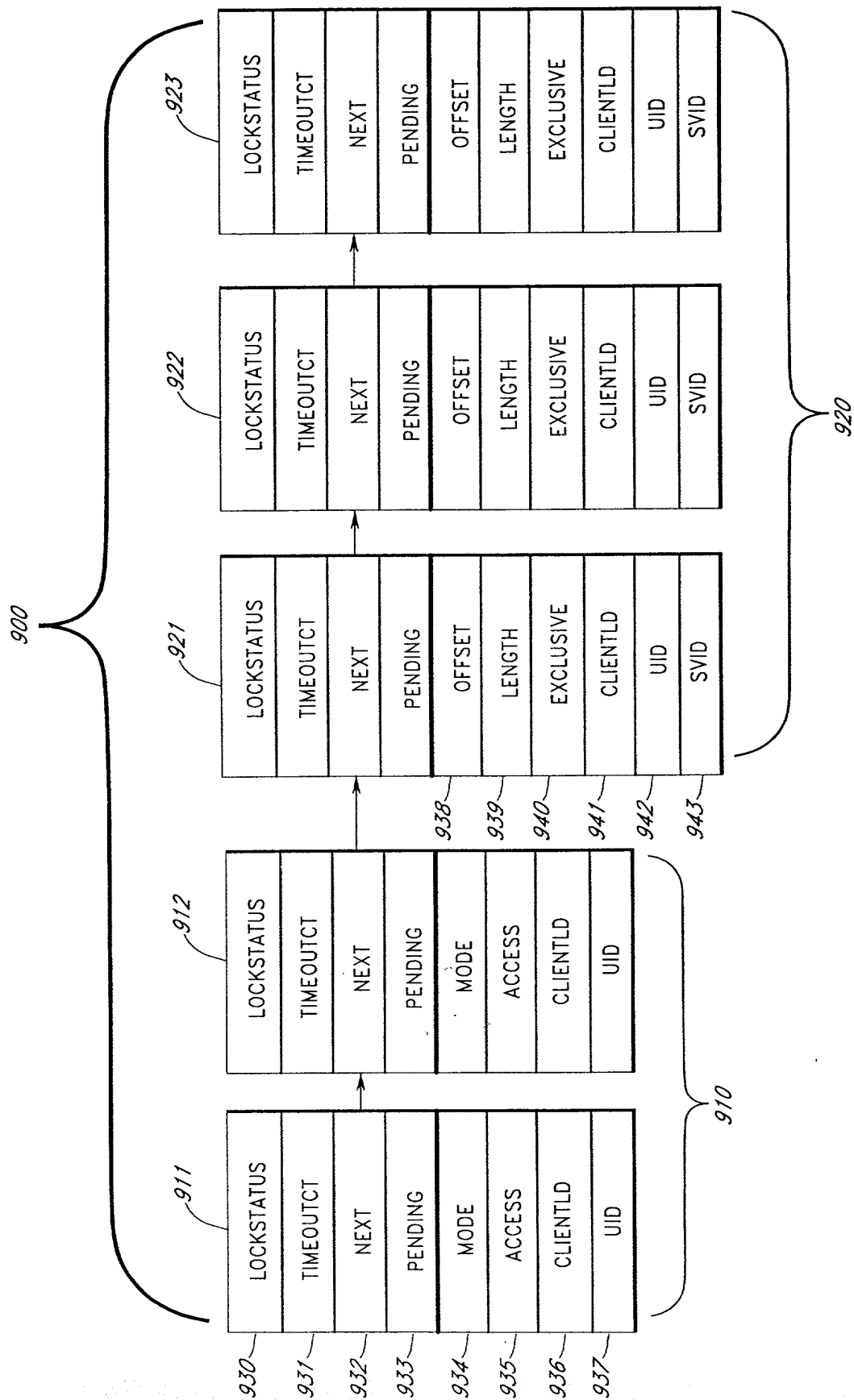


FIG. 9

20200907 2550300T

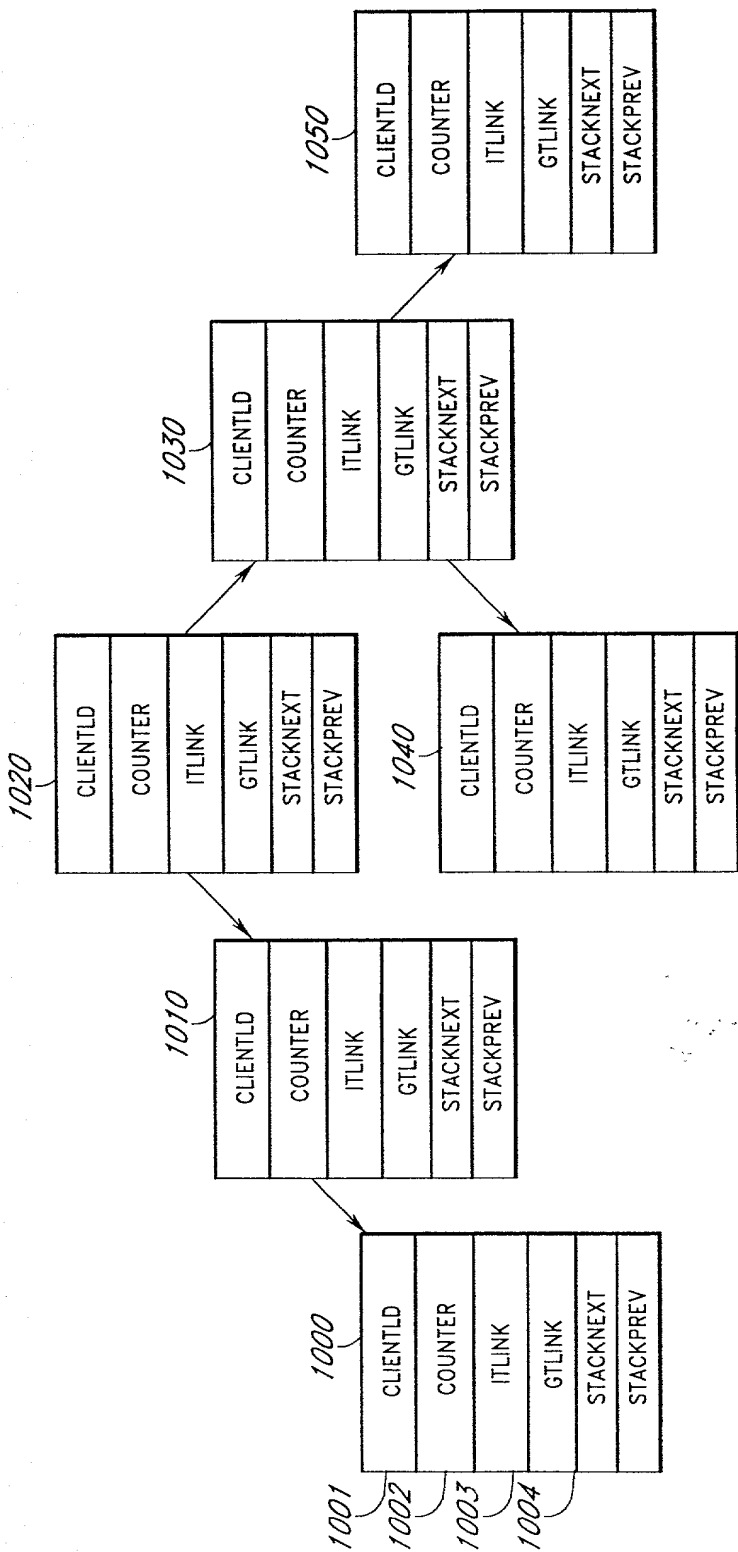


FIG. 10

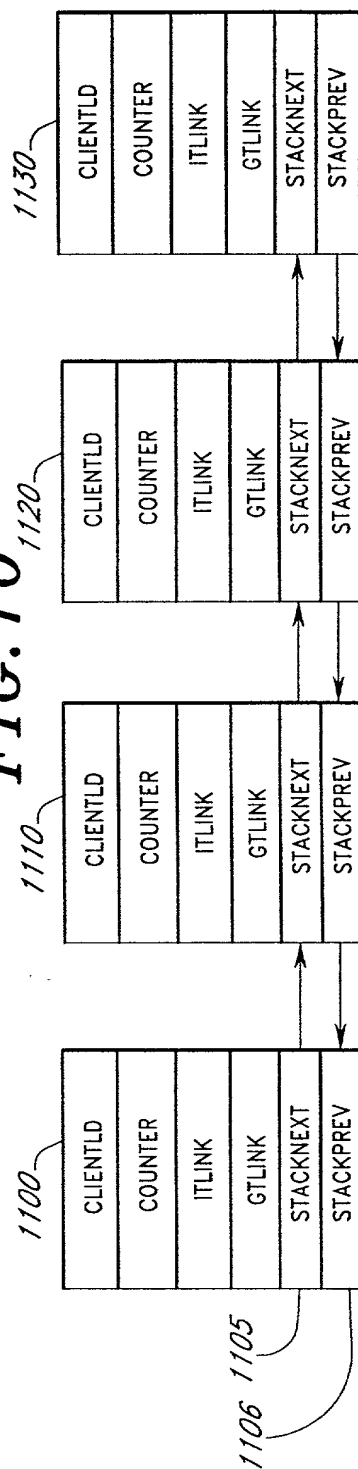
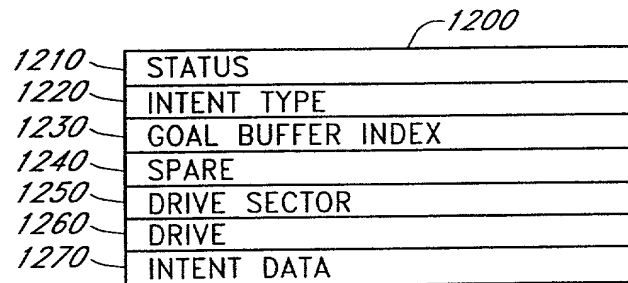
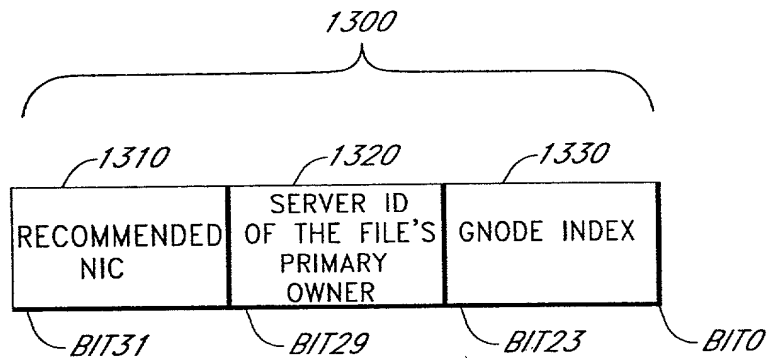


FIG. 11

*FIG. 12**FIG. 13*

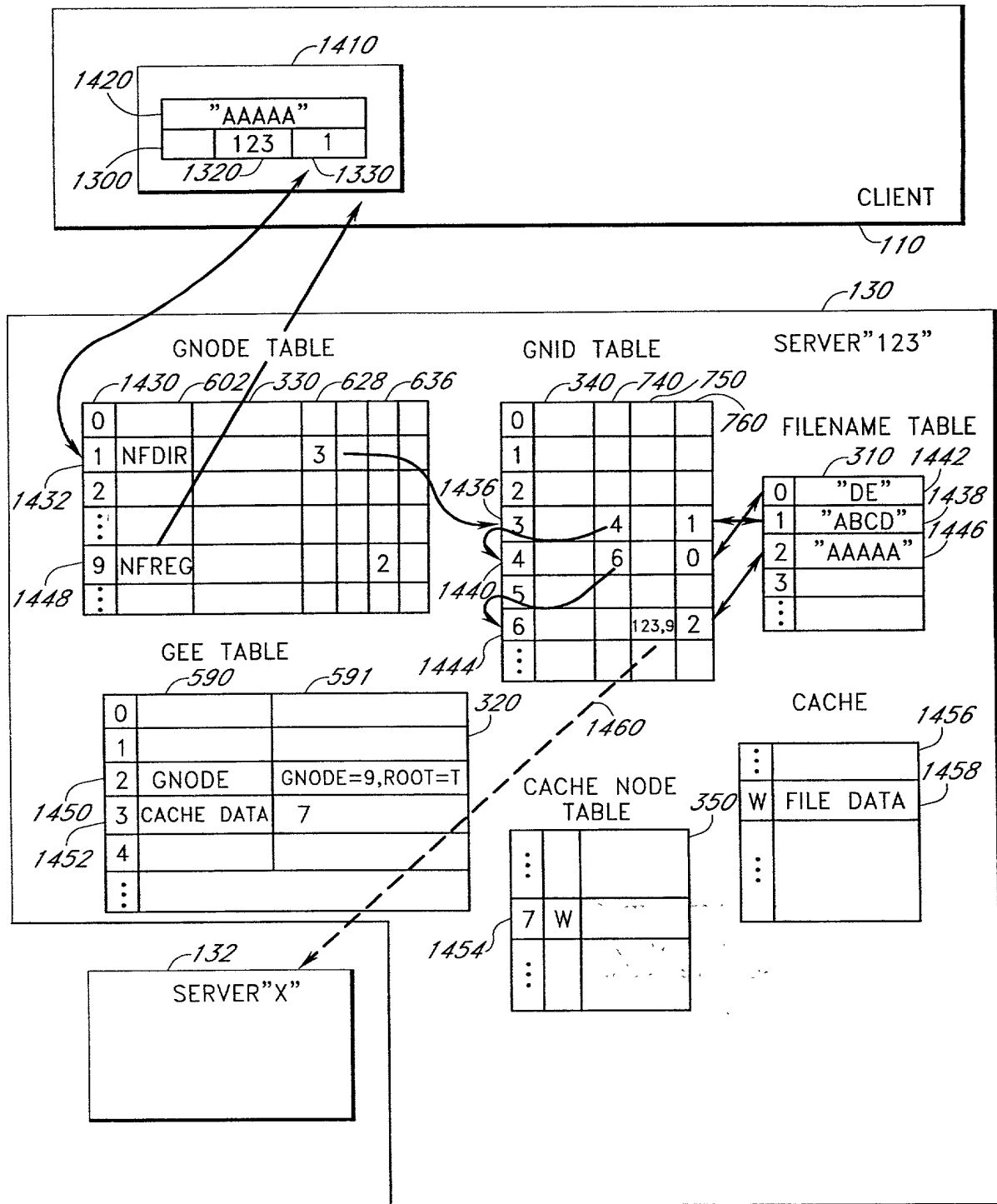


FIG. 14A

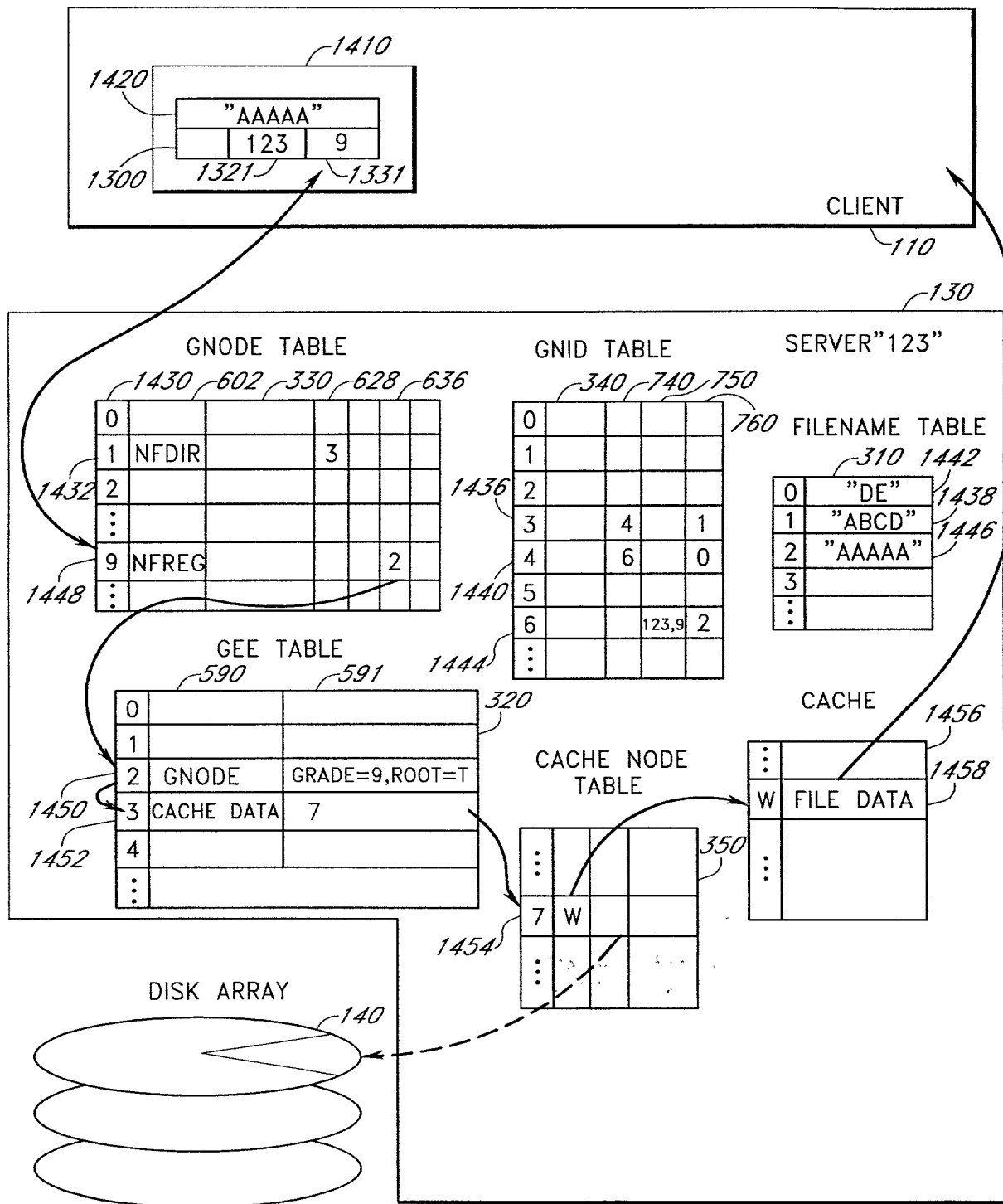


FIG. 14B

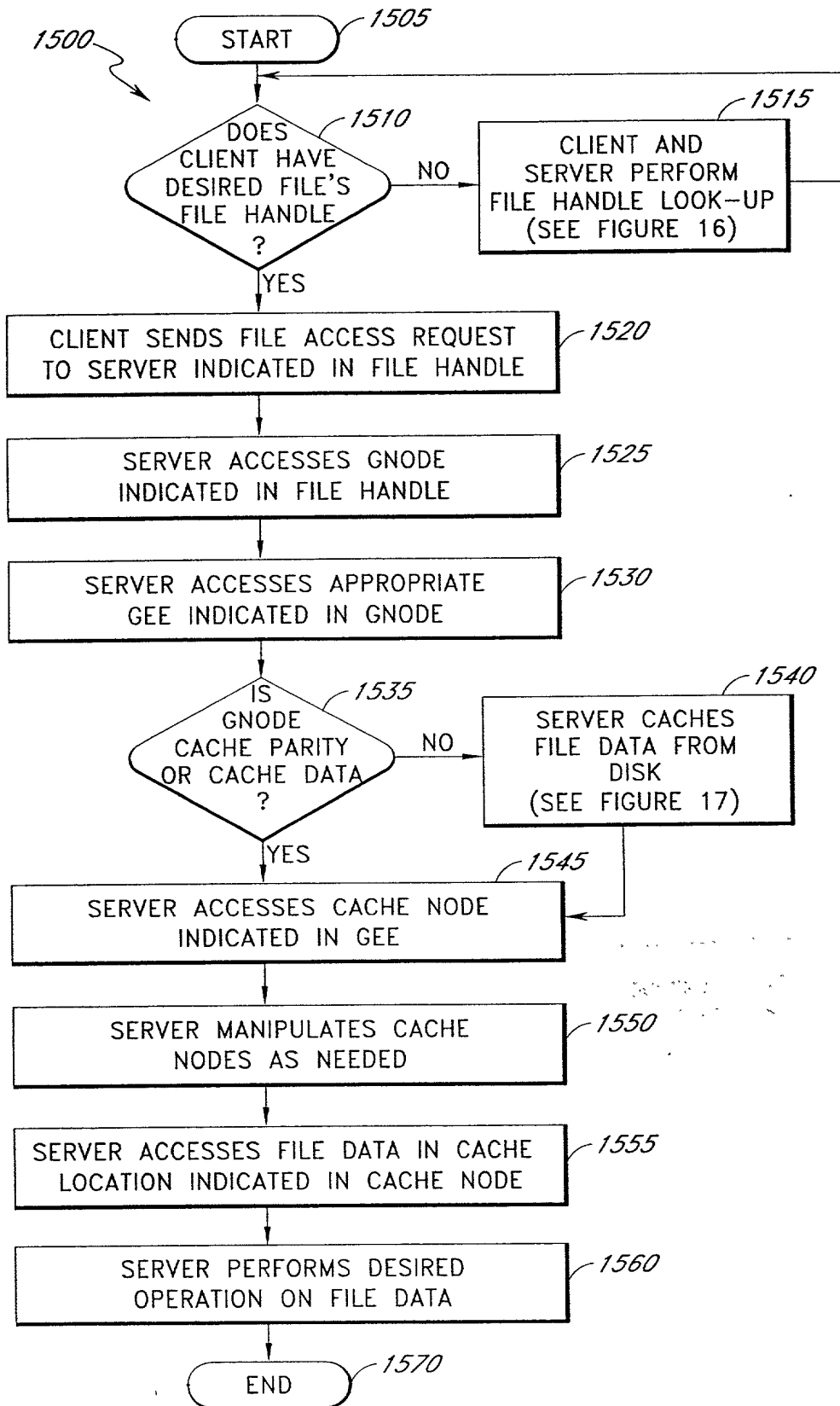
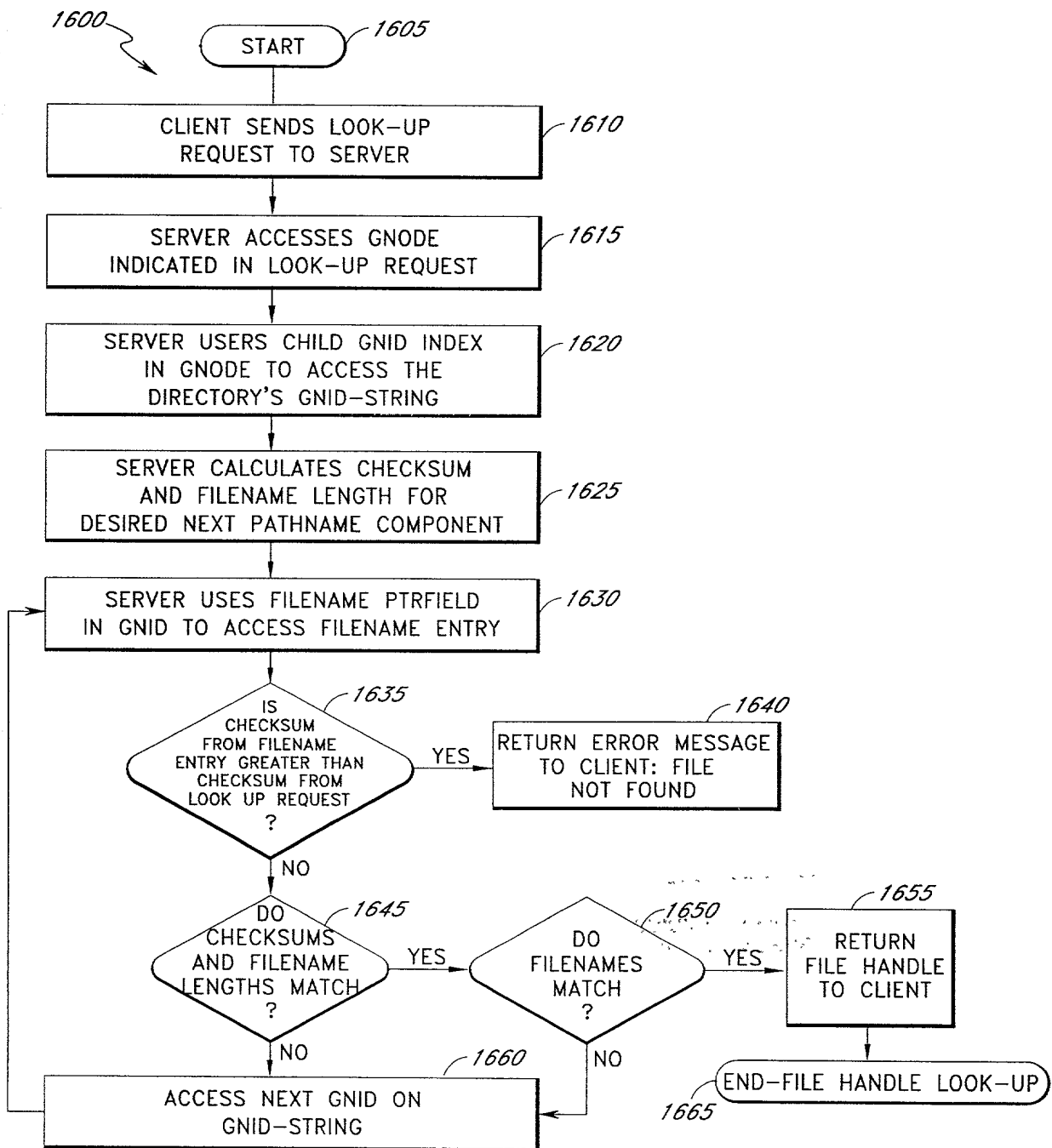
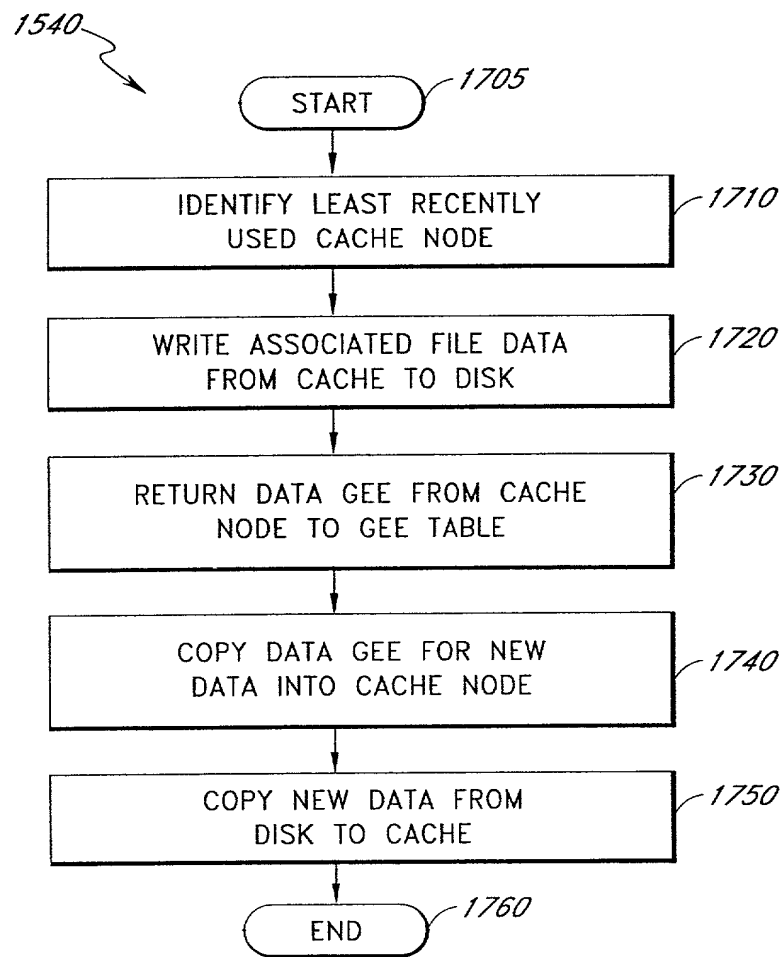


FIG. 15

**FIG. 16**



**FIG. 17**

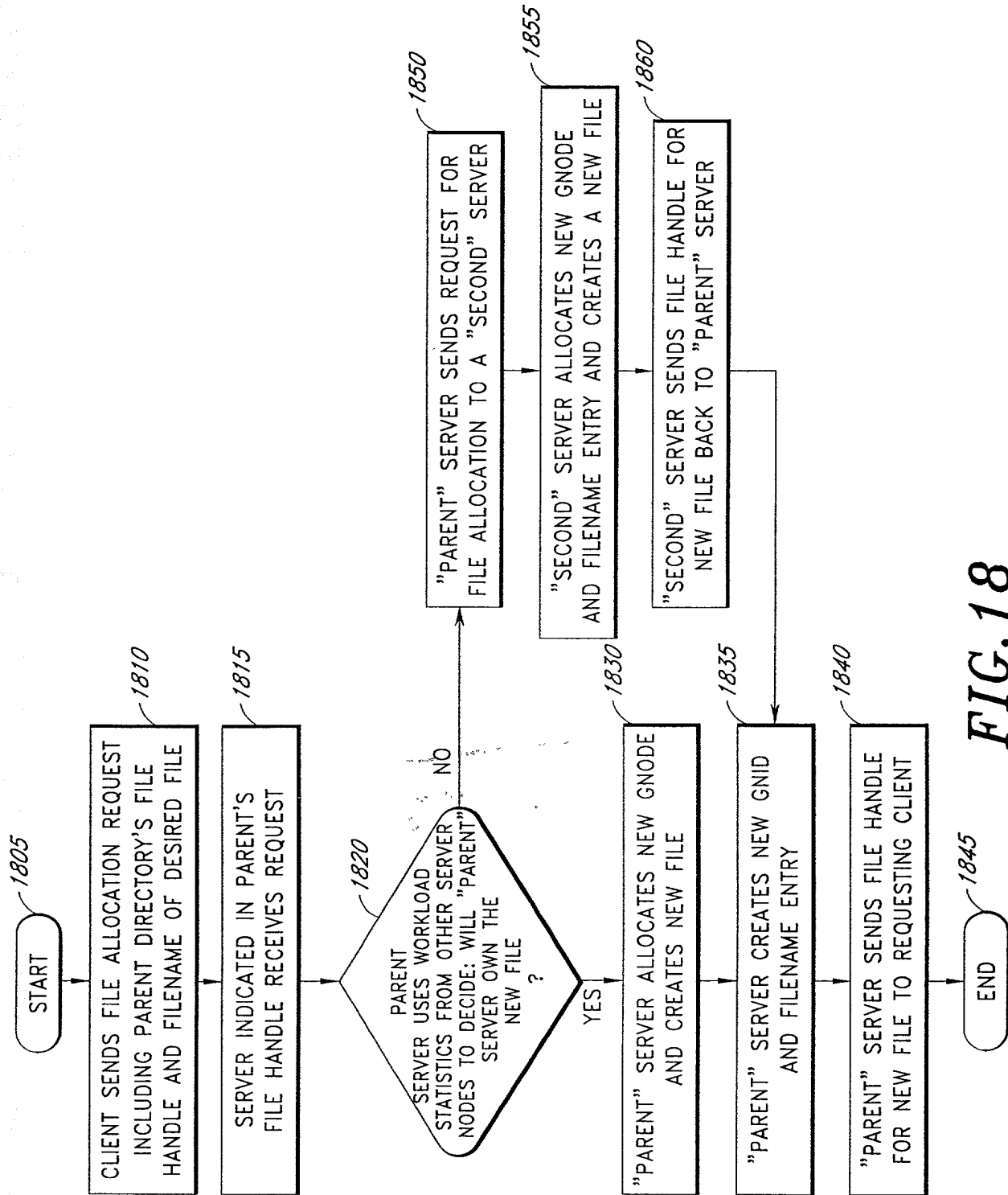


FIG. 18

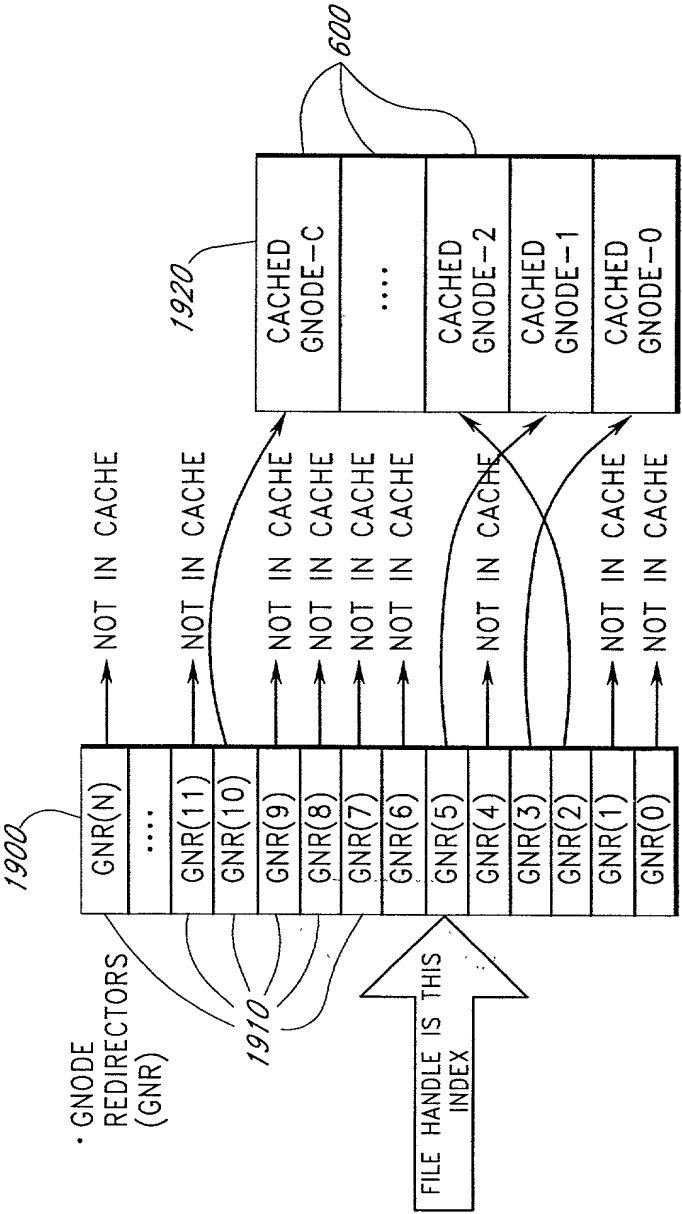
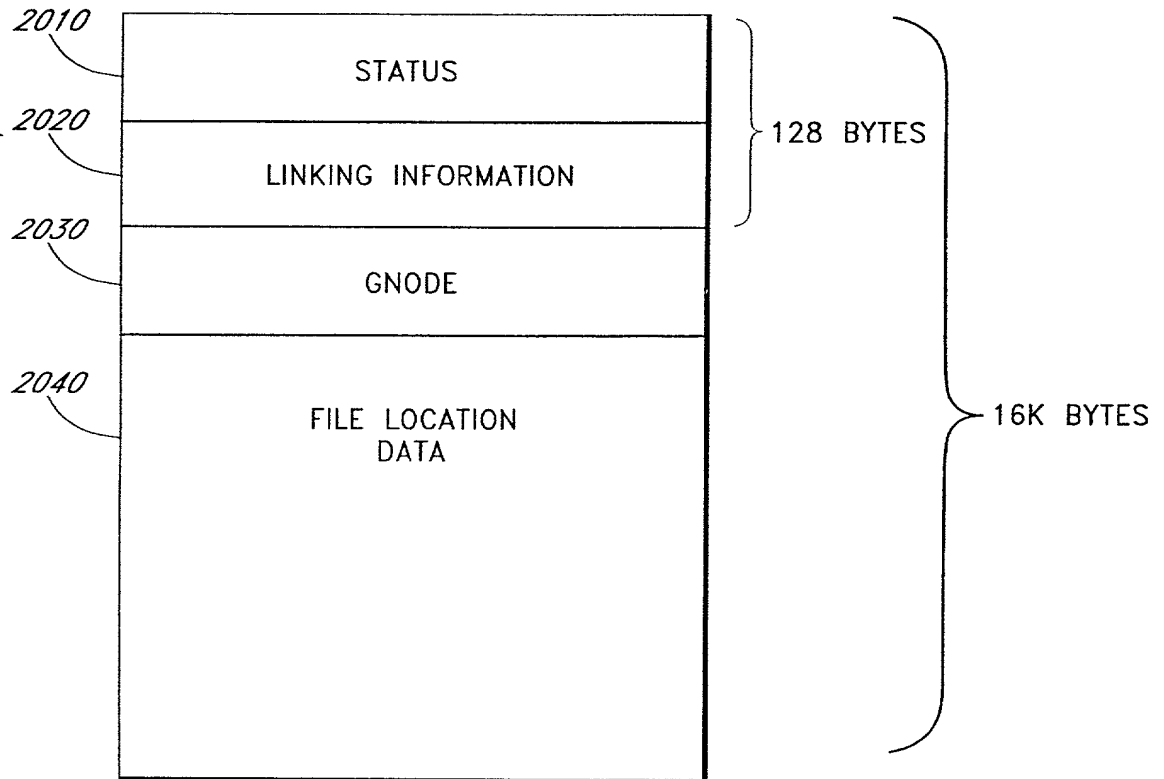


FIG. 19

**FIG. 20A**

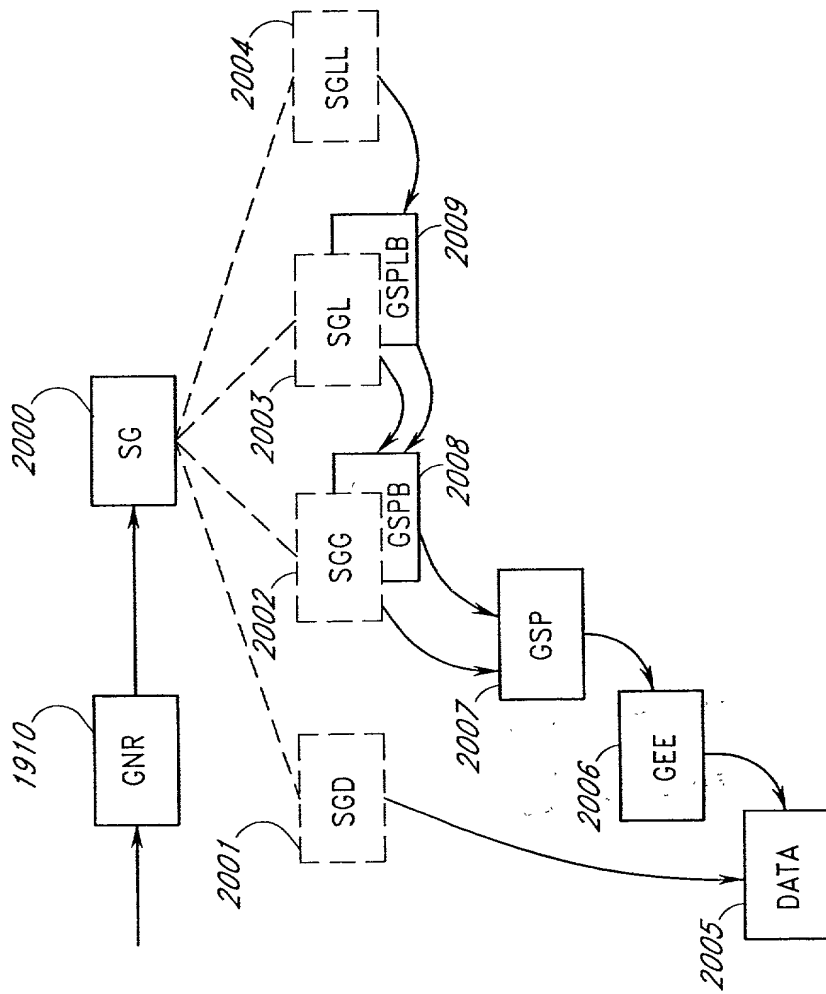


FIG.20B

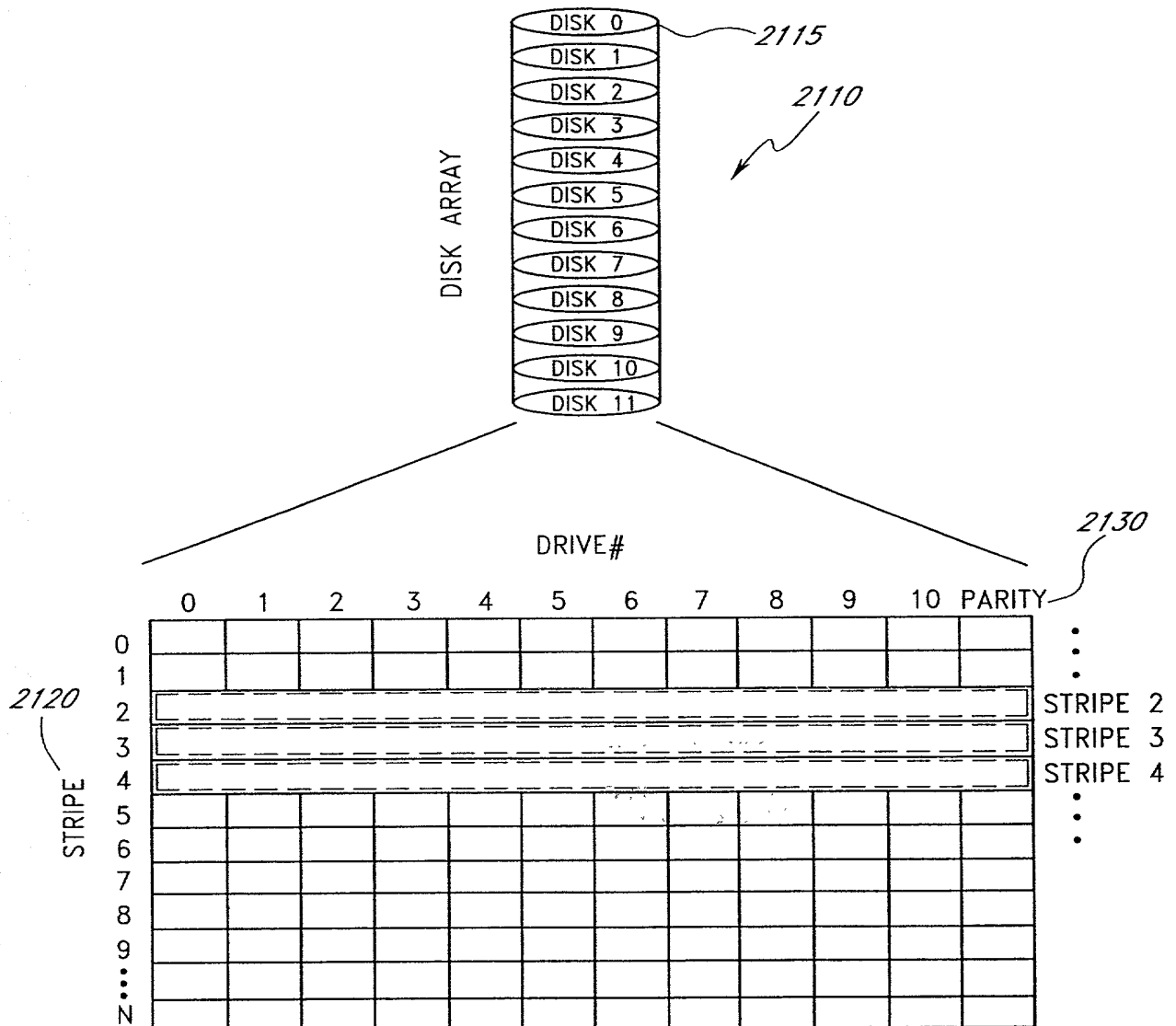
CONVENTIONAL RAID MAPPING  
(PRIOR ART)

FIG. 21

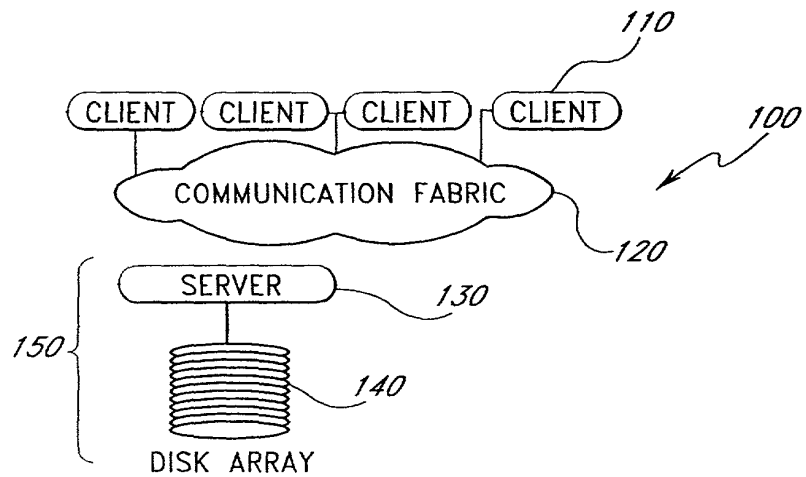


FIG. 22A

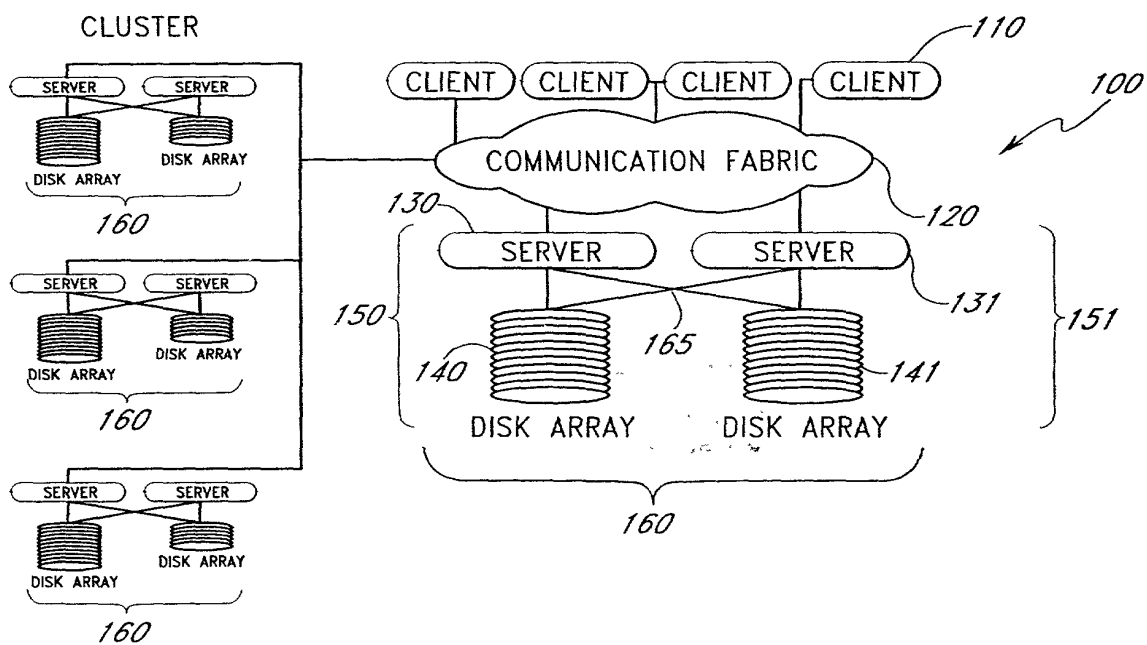


FIG. 22B

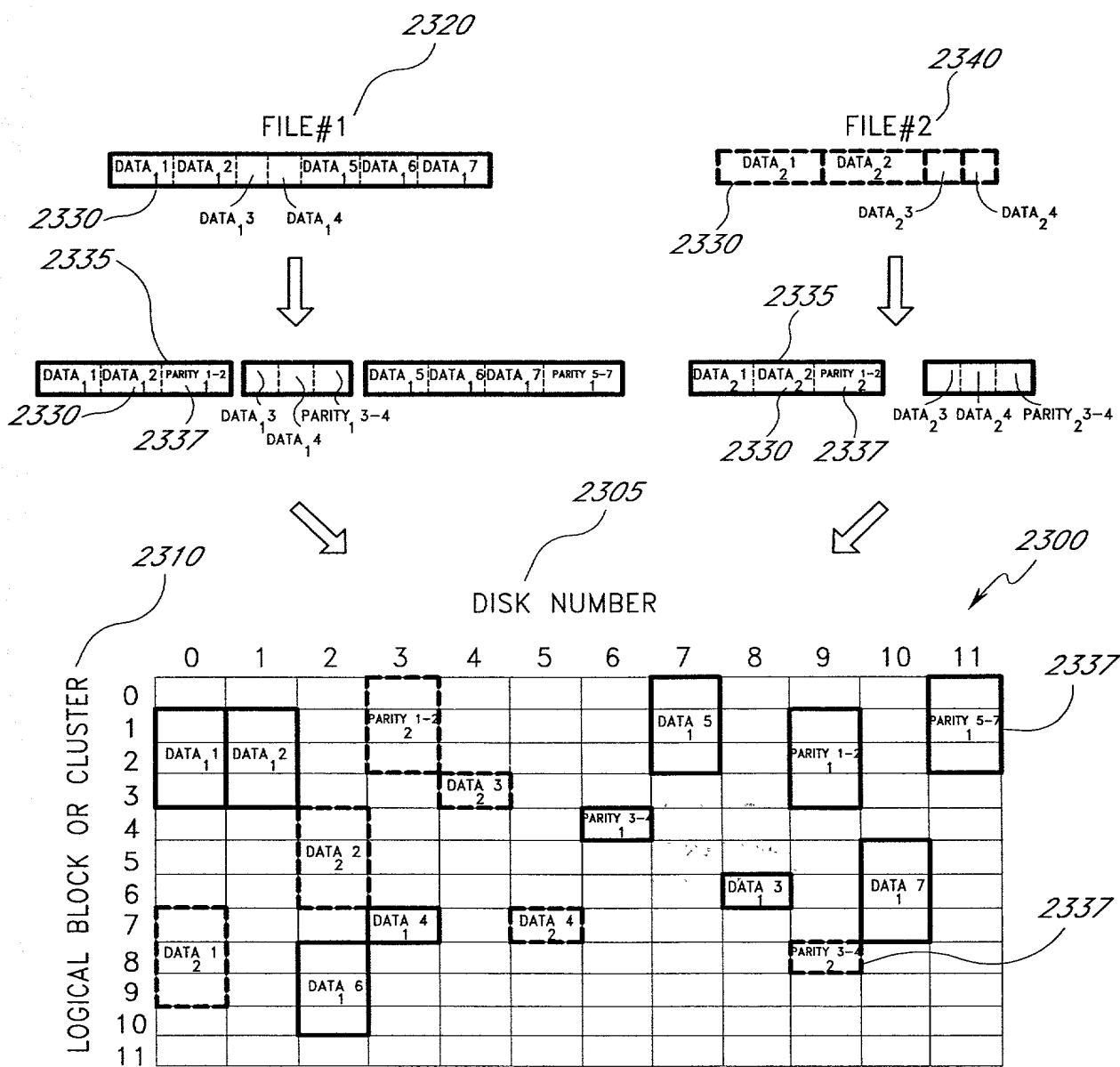
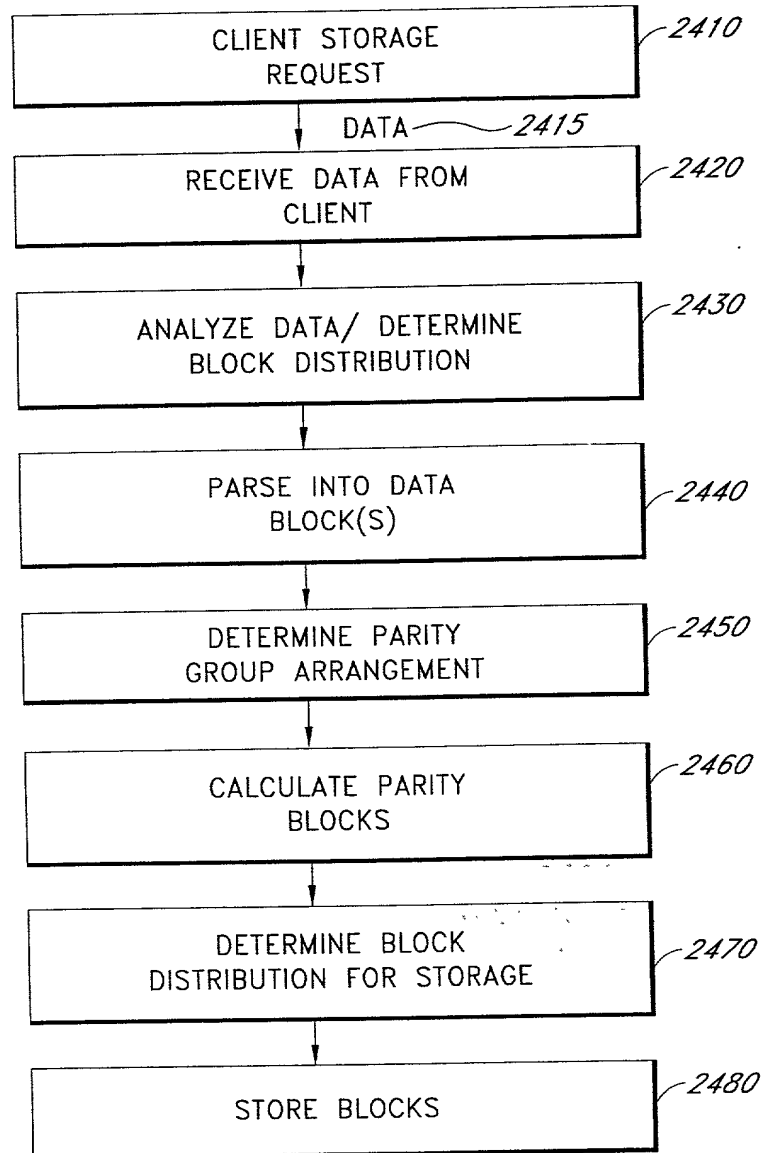
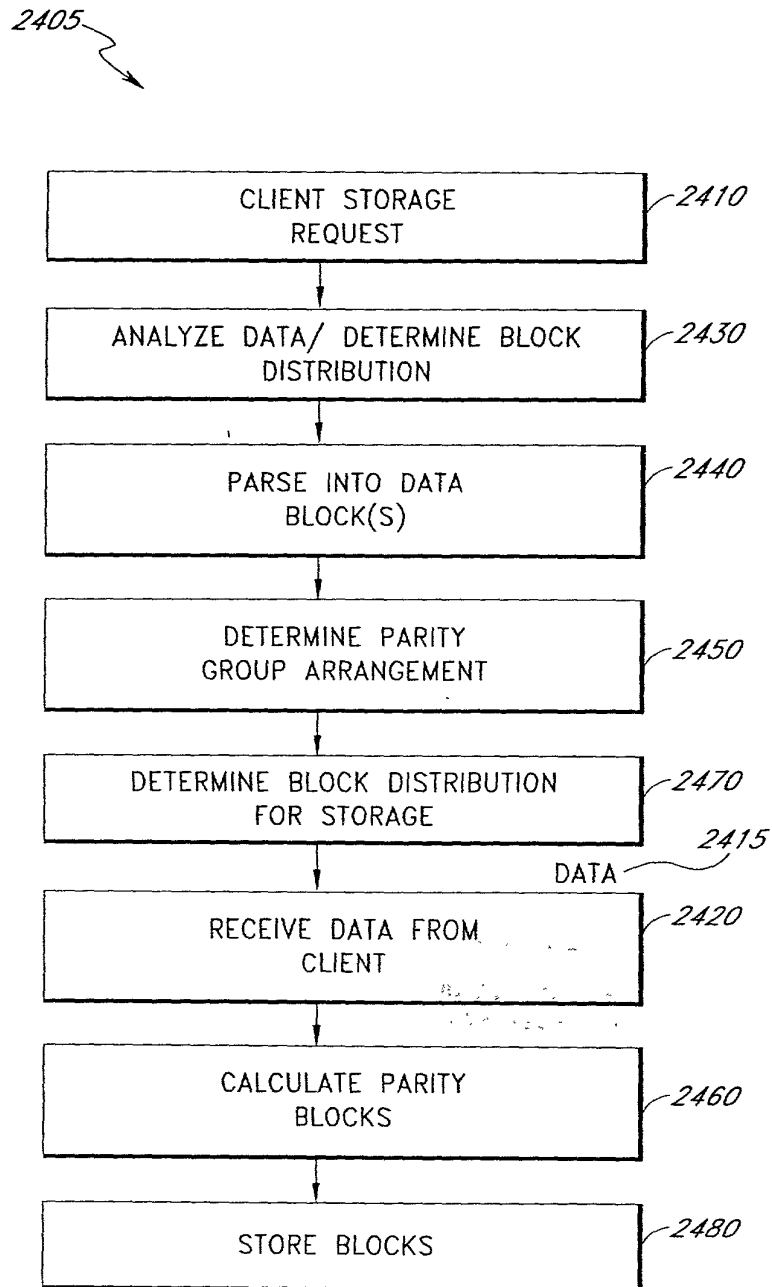


FIG.23



2400

**FIG. 24A**

**FIG. 24B**

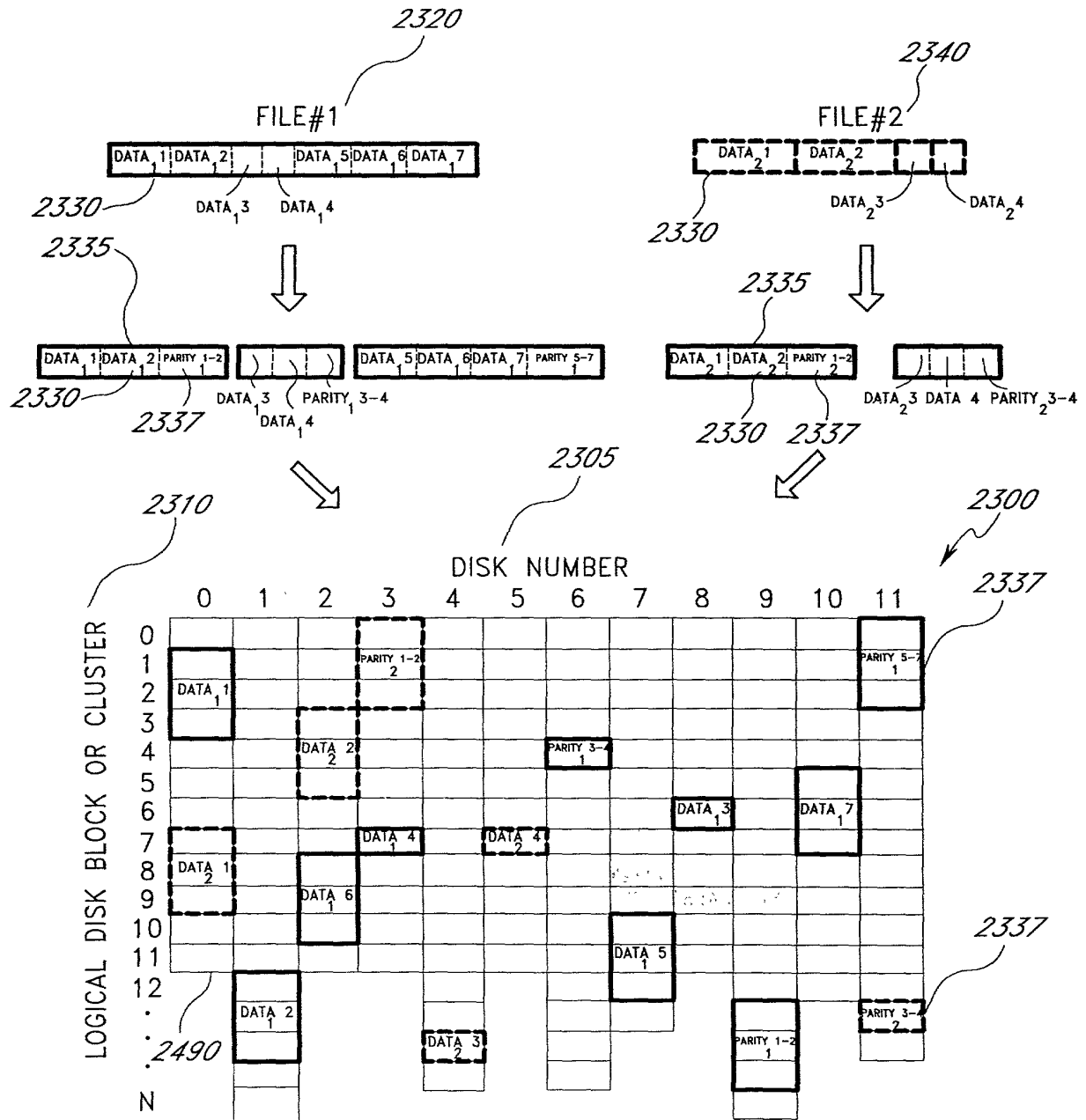
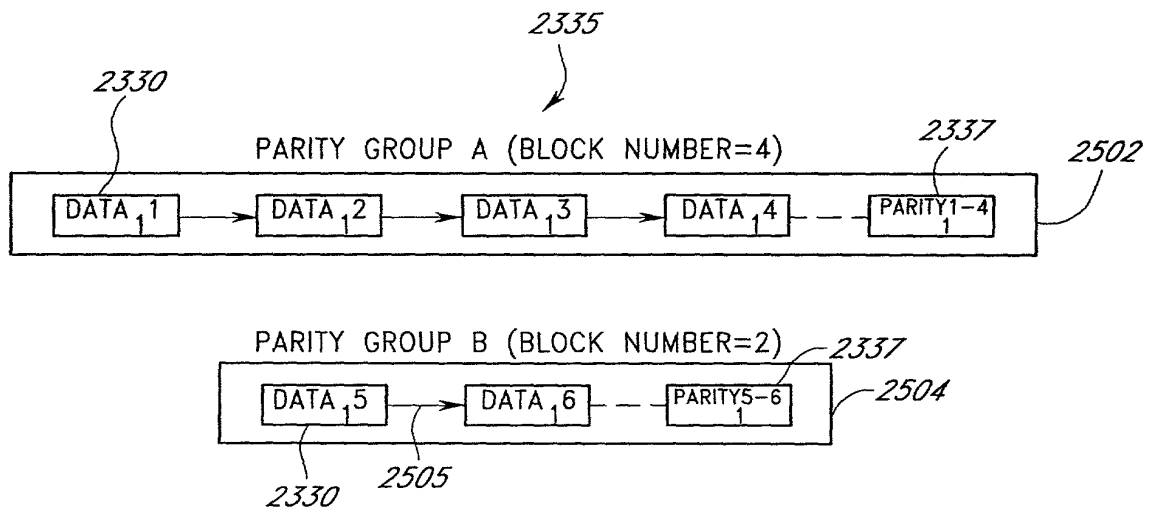
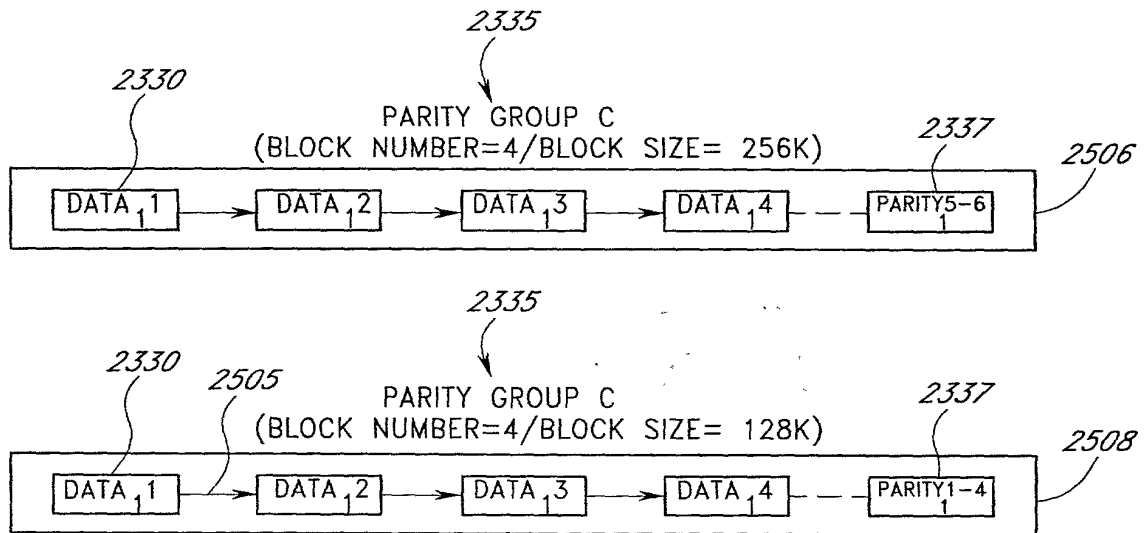


FIG. 25

**FIG. 26A****FIG. 26B**

DISK ARRAY INITIALIZATION USING GEE TABLE  
SPACE ALLOCATION

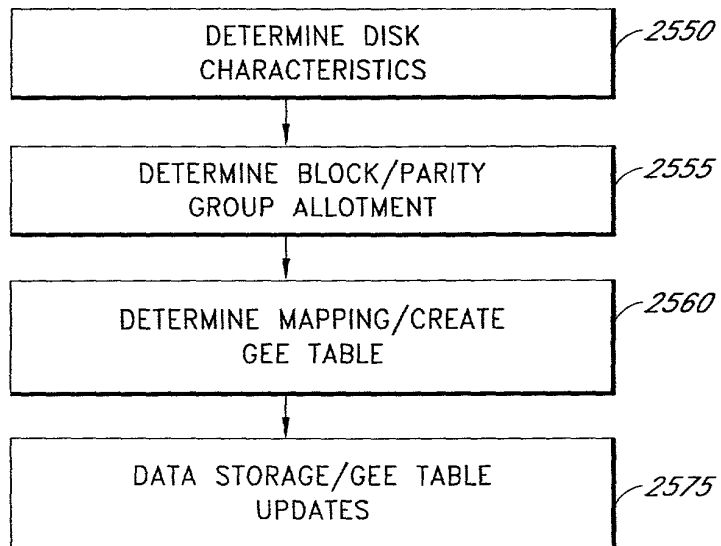
2530

2532 INDEX	2534 G-CODE	2536 DATA	2542
...	...	...	
45	GNODE	EXTENT=2	
2538 46	DATA	BLOCKS 456,457:DRIVE 13	2540
47	DATA	BLOCKS 667,668:DRIVE 15	
48	DATA	BLOCKS 112,113:DRIVE 19	
49	PARITY	BLOCKS 554,555:DRIVE 2	
...	...	...	
76	GNODE	EXTENT=2	
2538 77	DATA	BLOCKS 460,461,462:DRIVE 13	2540
78	DATA	BLOCKS 671,672,673:DRIVE 15	
79	PARITY	BLOCKS 121,122,123:DRIVE 19	
...	...	...	
88	GNODE	EXTENT=2	
89	DATA	BLOCKS 463,464,465:DRIVE 2	2540
90	DATA	BLOCKS 674,675,676:DRIVE 5	
91	PARITY	BLOCKS 124,125,126:DRIVE 13	
...	...	...	

**FIG. 27**

2448  
↓

## ARRAY PREPARATION/ G-TABLE FORMATTING

**FIG.28**

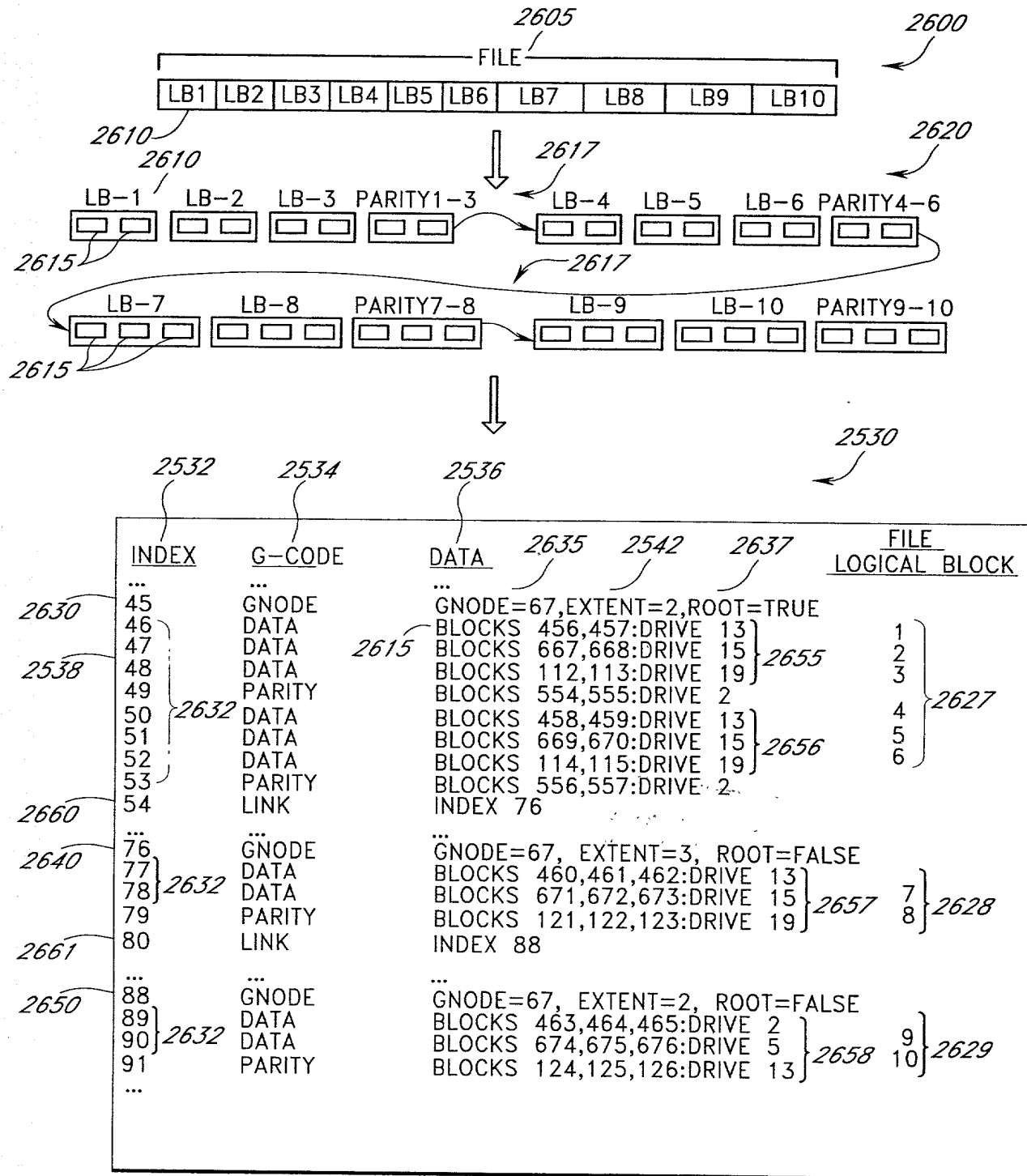


FIG.29

## DRIVE FAILURE RECOVERY MECHANISM

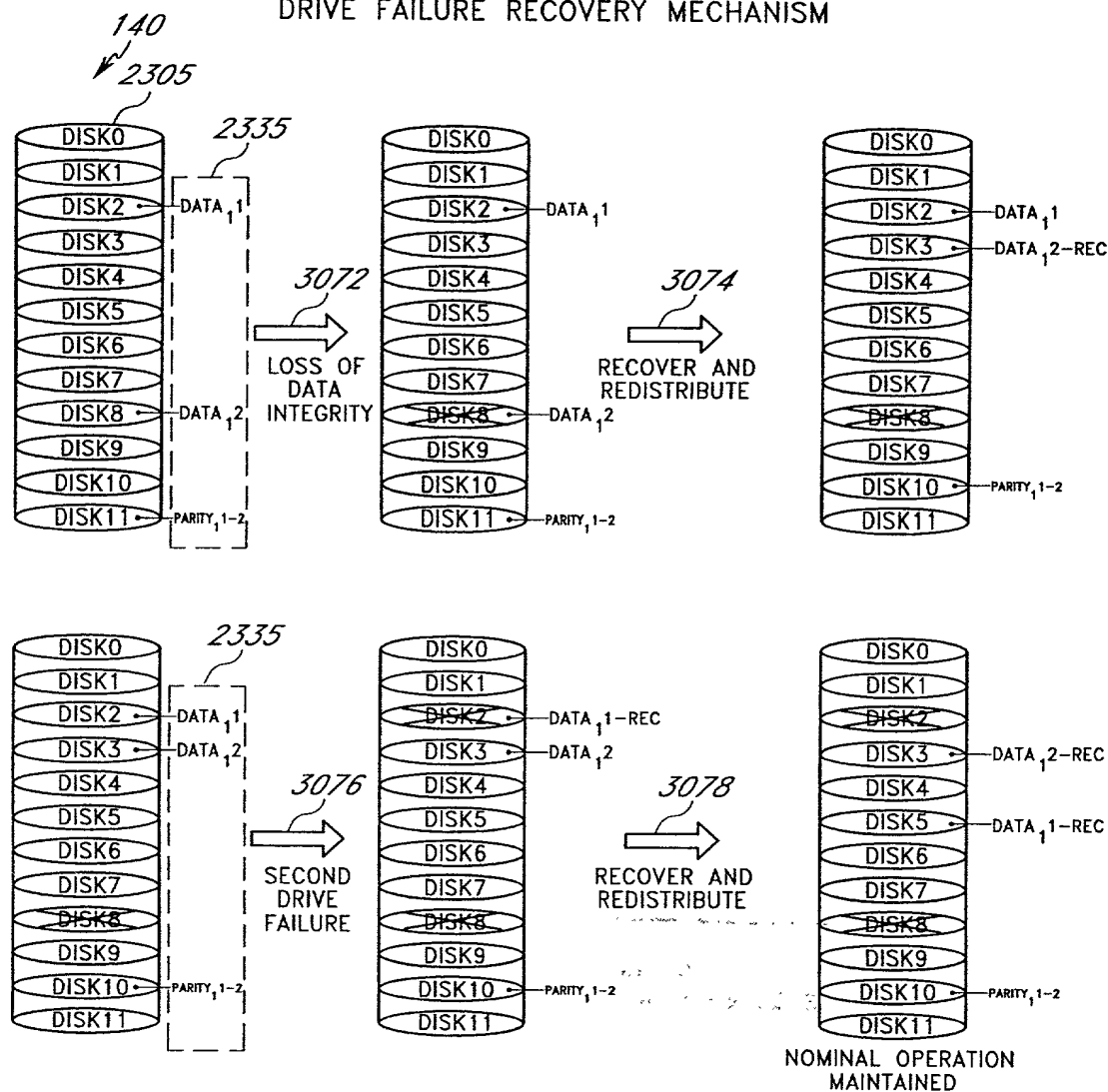


FIG.30



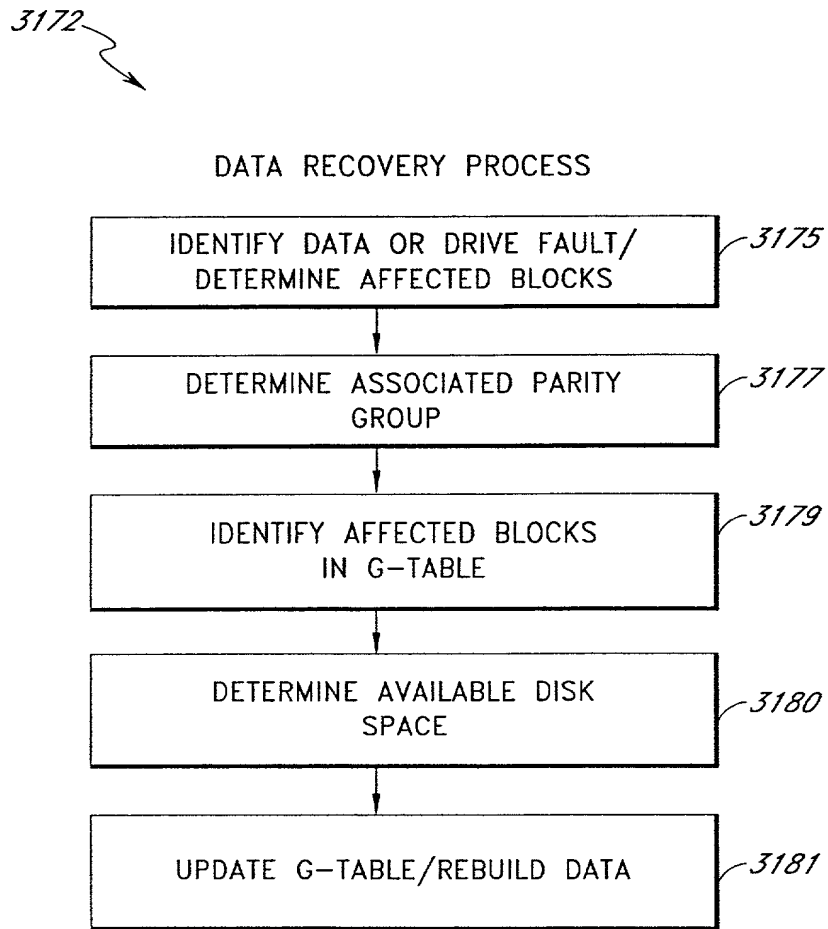
**FIG. 31**

FIG. 32A

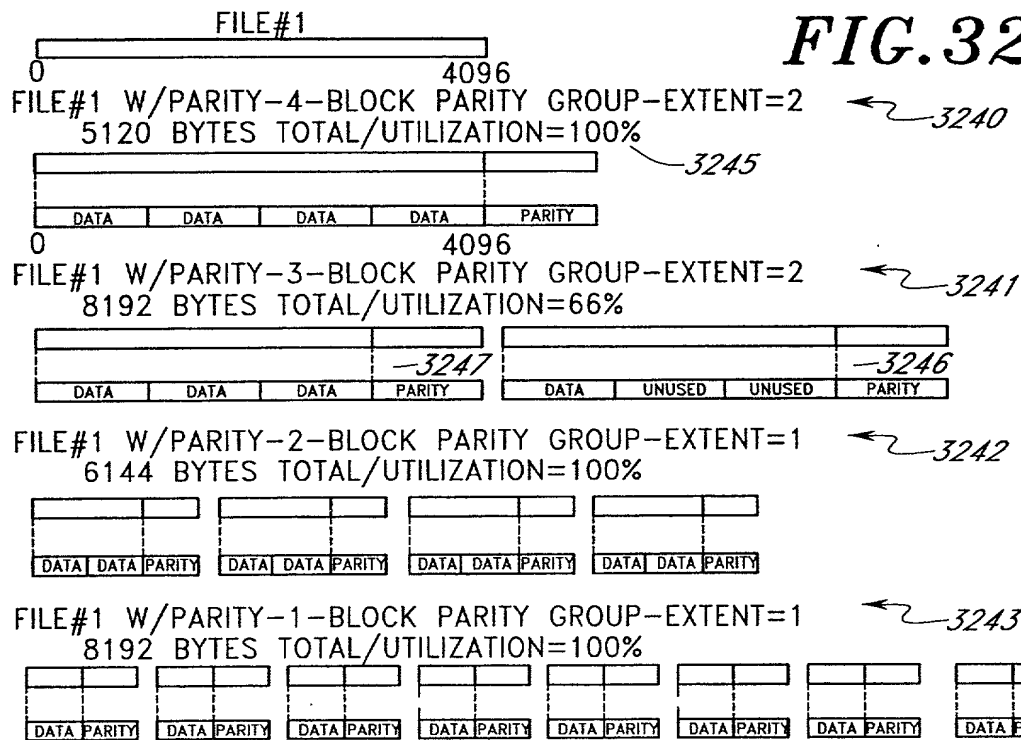
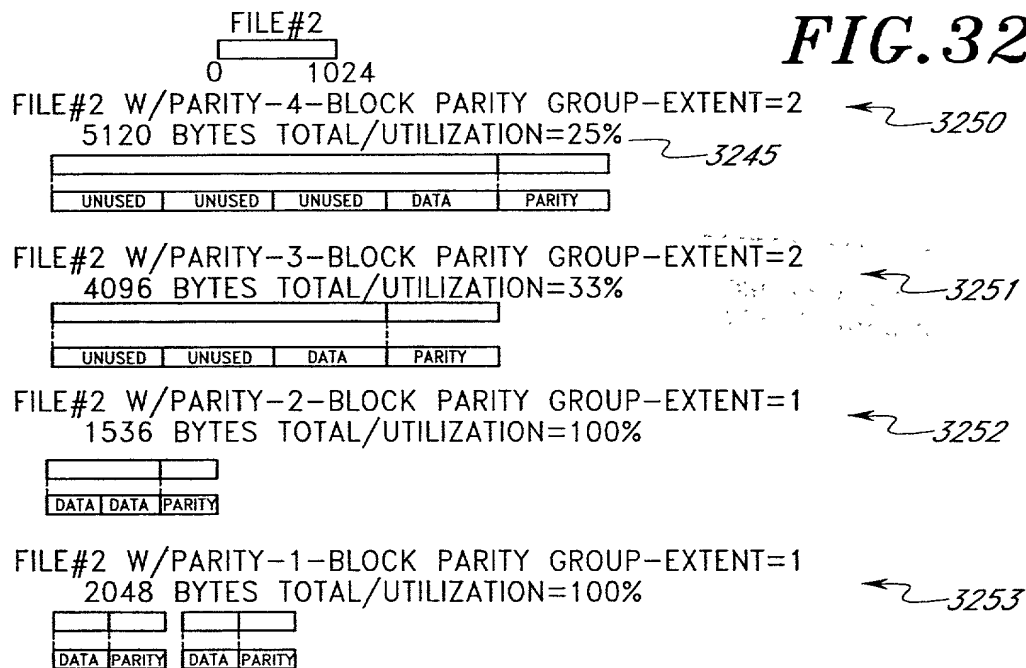


FIG. 32B



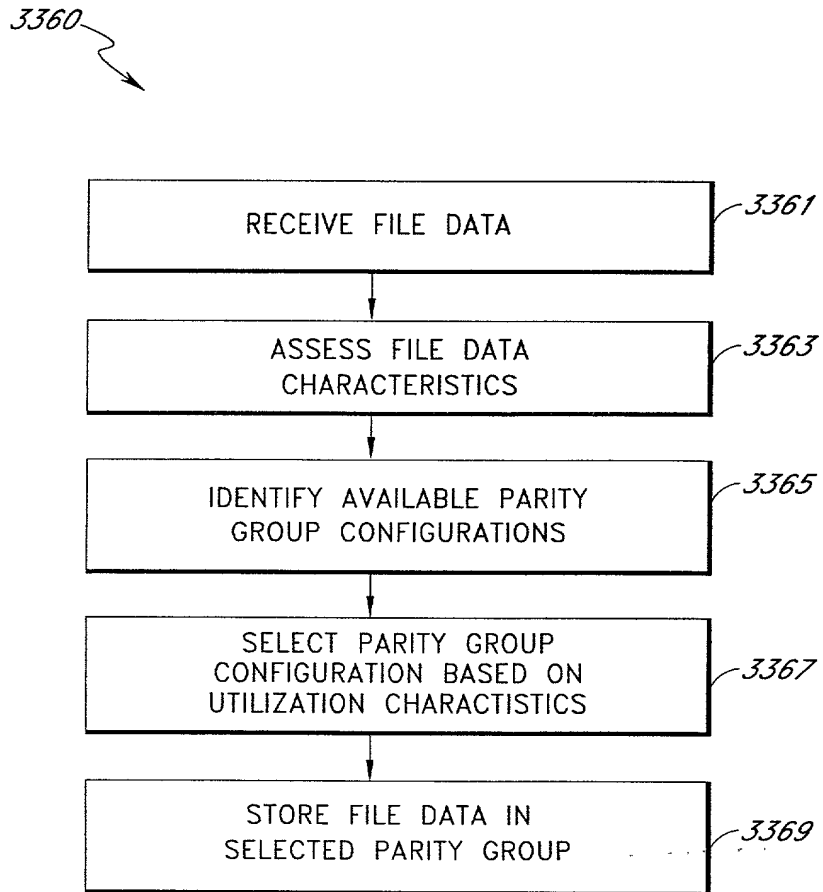
**FIG. 33**

FIG. 34A

INITIAL ALLOCATION <sup>3491</sup>			DISK SPACE% <sup>3485</sup>	
<div>DATA DATA DATA DATA PARITY</div>	4 BLOCK PANITY <sup>3480</sup>	10000 GROUPS	36%	
<div>DATA DATA DATA PARITY</div>	3 BLOCK PANITY <sup>3481</sup>	10000 GROUPS	28%	
<div>DATA DATA PARITY</div>	2 BLOCK PANITY <sup>3482</sup>	10000 GROUPS	22%	
<div>DATA PARITY</div>	1 BLOCK PANITY <sup>3483</sup>	10000 GROUPS	14%	

FIG. 34B

		DISK USAGE <sup>3487</sup>			DISK SPACE%
		FREE <sup>3492</sup>	OCCUPIED <sup>3490</sup>	TOTAL	
<sup>3480</sup>	4 BLOCK PANITY	2500 GROUPS	7500 GROUPS	10000 GROUPS	36%
<sup>3481</sup>	3 BLOCK PANITY	7500 GROUPS	2500 GROUPS	10000 GROUPS	28%
<sup>3482</sup>	2 BLOCK PANITY	3500 GROUPS	6500 GROUPS	10000 GROUPS	22%
<sup>3483</sup>	1 BLOCK PANITY	500 GROUPS	9500 GROUPS	10000 GROUPS	14%

FIG. 34C

		REDISTRIBUTION <sup>3494</sup>			DISK SPACE%
		FREE <sup>3492</sup>	OCCUPIED <sup>3490</sup>	TOTAL	
<sup>3480</sup>	4 BLOCK PANITY	2500 GROUPS	7500 GROUPS	10000 GROUPS	36%
<sup>3481</sup>	3 BLOCK PANITY	-5000 GROUPS OF 3 BLOCK PANITY	2500 groups	5000 GROUPS	14%
<sup>3482</sup>	2 BLOCK PANITY	+10000 GROUPS OF 1 BLOCK PANITY	3500 GROUPS	10000 GROUPS	22%
<sup>3483</sup>	1 BLOCK PANITY		10500 GROUPS	20000 GROUPS	28%

REDISTRIBUTION

## PARITY GROUP REDISTRIBUTION PROCESSES

3500

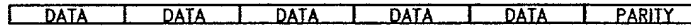
**FIG. 35A**

## PARITY GROUP DISSOLUTION

3510

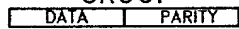
## 5-BLOCK PARITY GROUP

3515



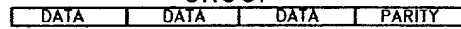
## 1-BLOCK PARITY GROUP

3520



## 3-BLOCK PARITY GROUP

3525



OR

## 2-BLOCK PARITY GROUP

3530



## 2-BLOCK PARITY GROUP

3530



OR

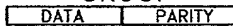
## 1-BLOCK PARITY GROUP

3520



## 1-BLOCK PARITY GROUP

3520



## 1-BLOCK PARITY GROUP

3520

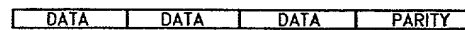
**FIG. 35B**

## PARITY GROUP CONSOLIDATION

3535

## 3-BLOCK PARITY GROUP

3525



## 1-BLOCK PARITY GROUP

3520



OR

## 3-BLOCK PARITY GROUP

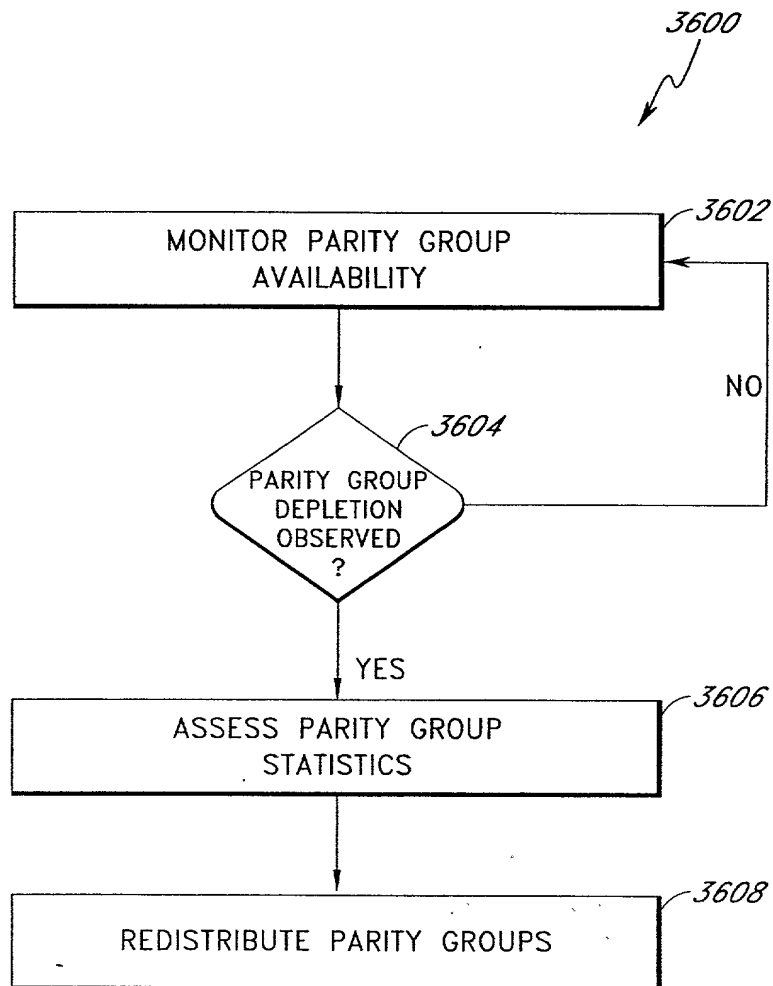
3515



## 2-BLOCK PARITY GROUPS

3530



**FIG.36**

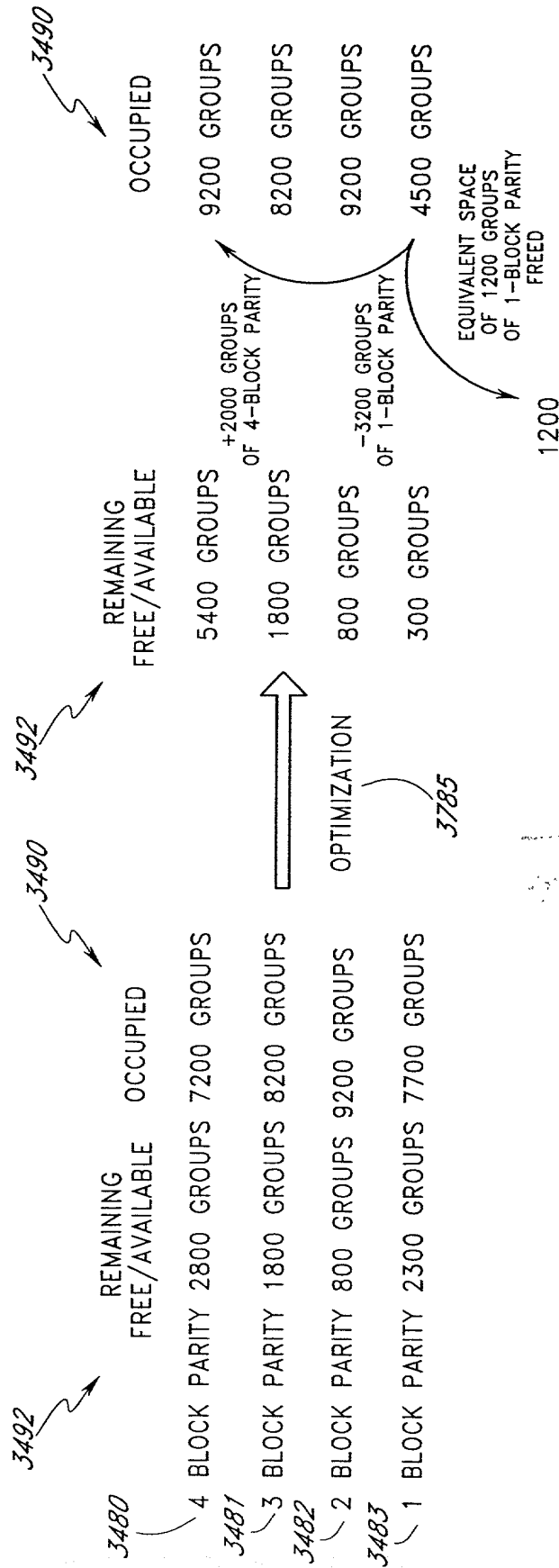
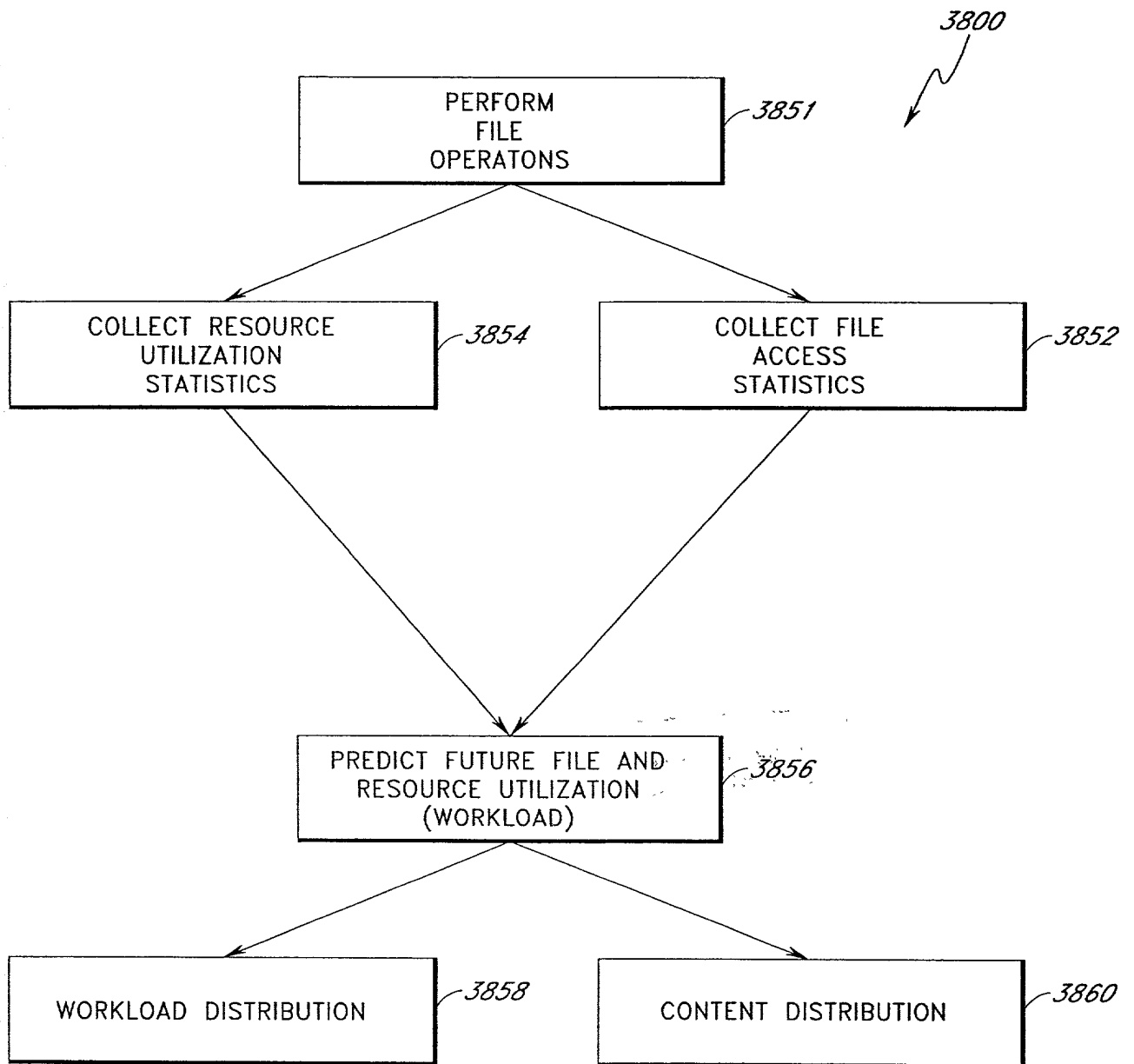


FIG. 37

**FIG.38**



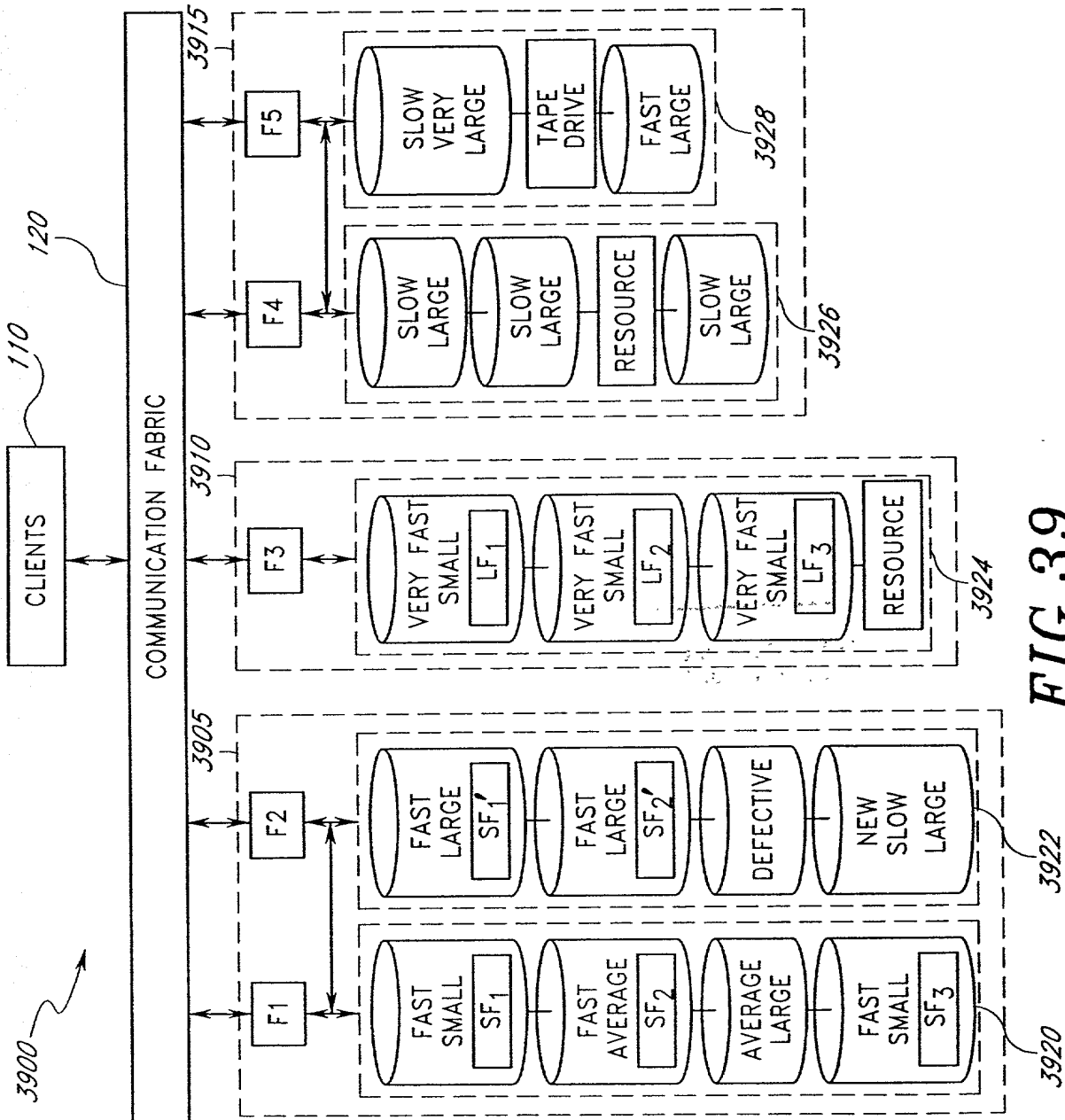


FIG. 39

FIG. 40

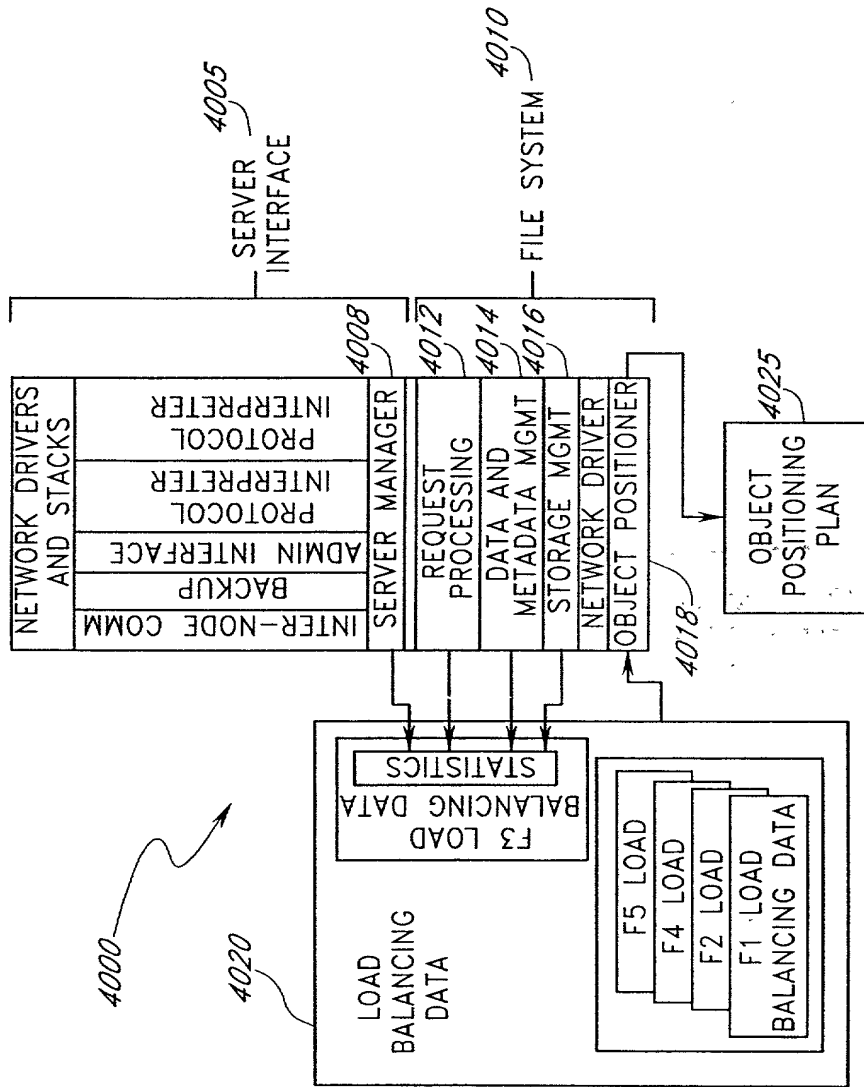
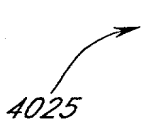


FIG. 40

### F3 OBJECT POSITIONING PLAN

- 
- PUSH LF TO F4-F5 CLUSTER
  - ISSUE FILE HANDLE FOR LF=STALE
  - IF REQUESTED,
    - SEND ACCEPTANCE FOR COPY OF SF TO F1
    - CREATE COPY OF SF
    - SEND FILE HANDLE OF SF TO F1

***FIG. 41***

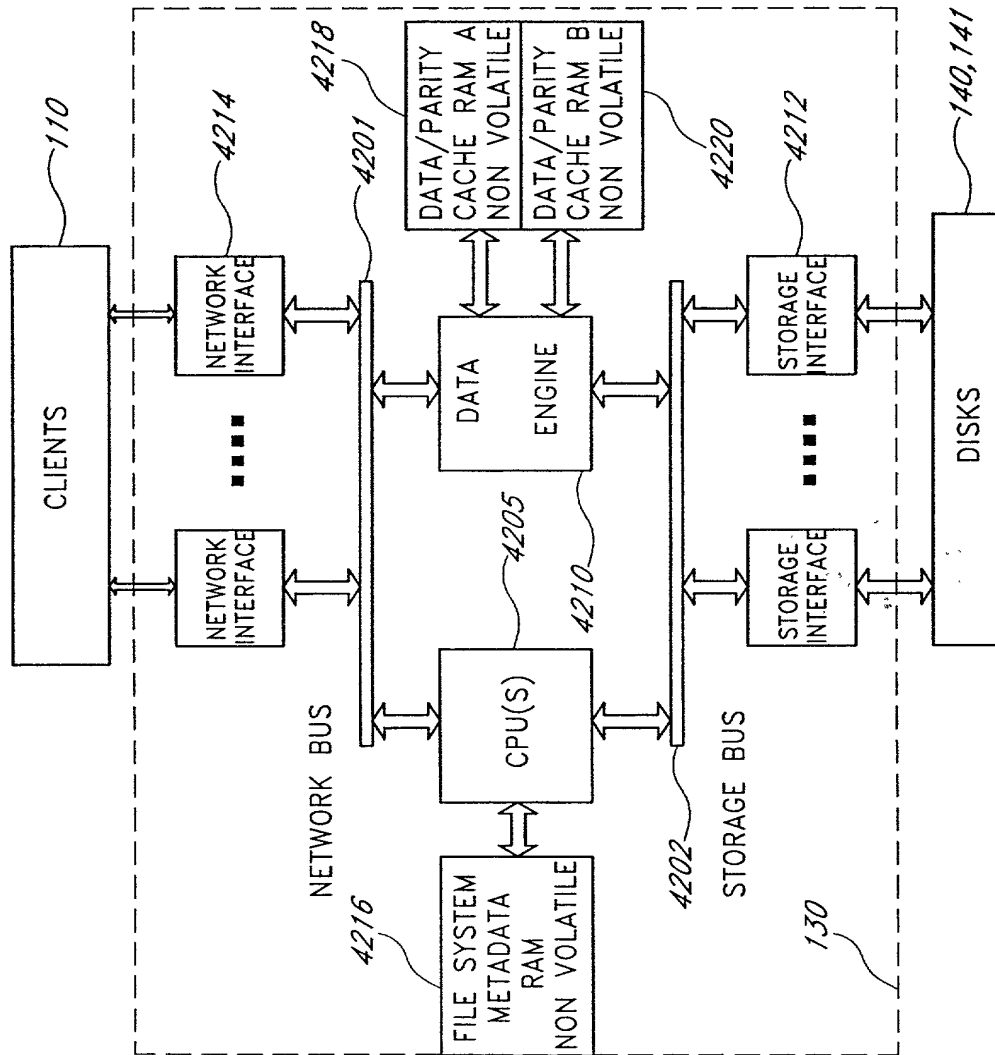


FIG. 42

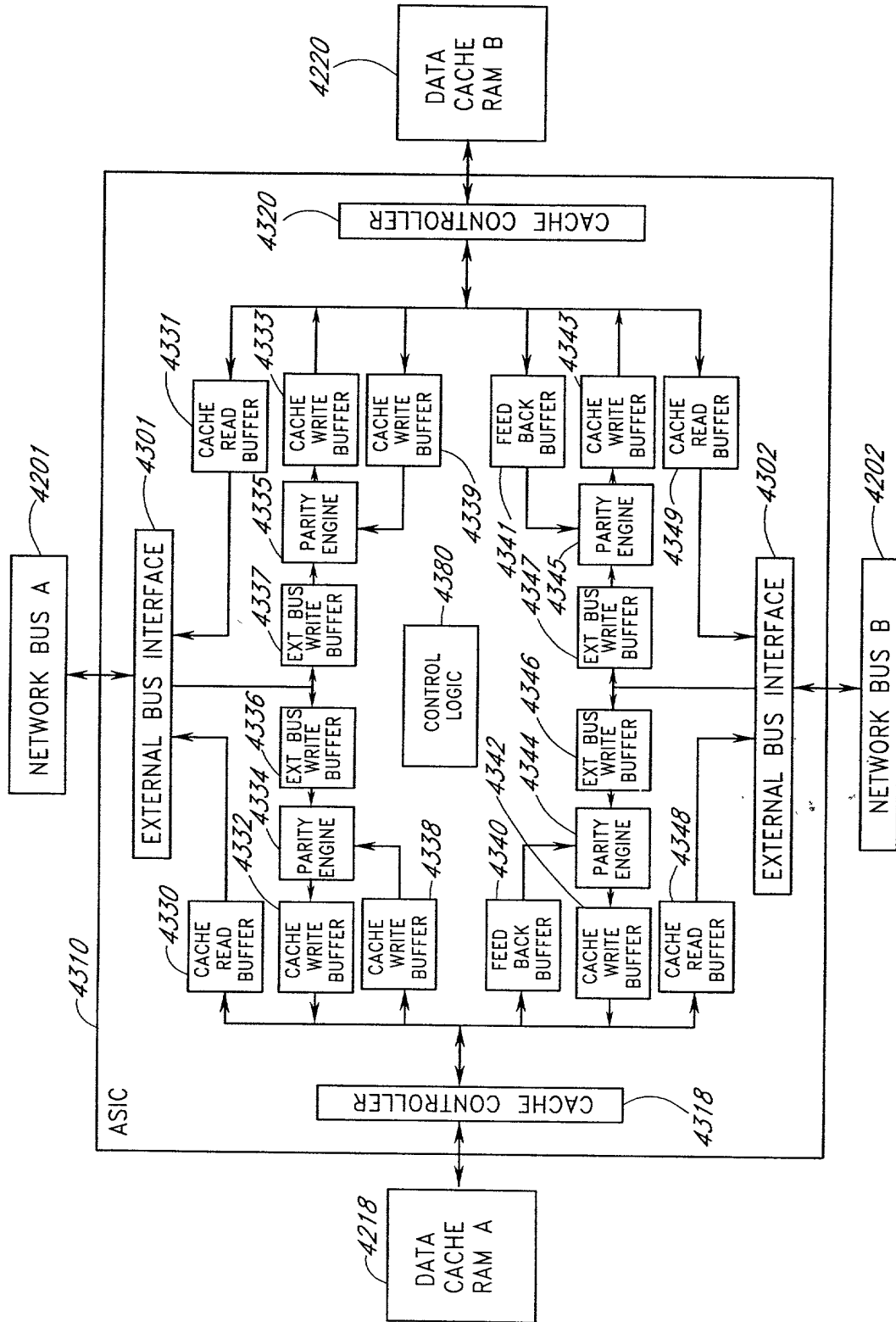


FIG. 43

PCI MAP	BLOCK SIZE	OPCODE	SPARE	PARITY INDEX	SPARE	RAM ADR
---------	------------	--------	-------	--------------	-------	---------

63.....62,61 .....59,58 .....56,55 .....51, 50 .....35,34,32, 31 .....0

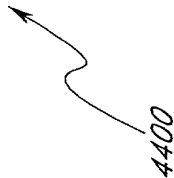


FIG. 44